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LANDING-FORCE MANUAL

UNITED STATES NAVY

1920

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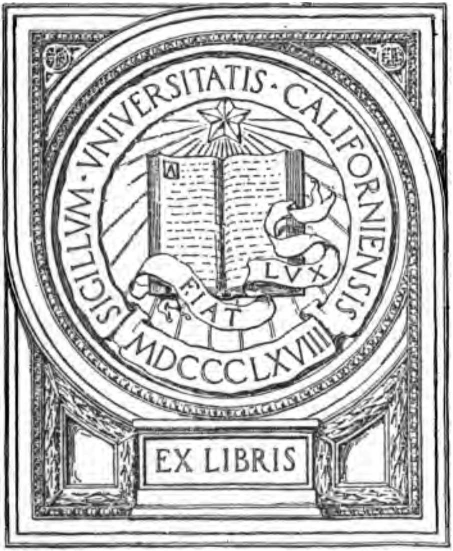
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LANDING-FORCE MANUAL

UNITED STATES NAVY

1920

Revised under the direction of the Navy Department
by a board consisting of

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NAVY DEPARTMENT.

Washington, 26 May, 1920.

The Landing-Force Manual, U. S. Navy, 1920, is approved and herewith published for the information and guidance of the U. S. Naval Service.

These instructions supersede all others of a similar nature and will be strictly observed.

JOSEPHUS DANIELS,
Secretary of the Navy.

442497

PREFACE.

While operating on shore, whether alone or in conjunction with the vessels of the fleet, the landing force, if well trained and efficiently handled, carries out the same tactics, and in the same manner, as would a similar force from the U. S. Armv under the same conditions. There appears to be no valid reason why a recruit, when entering one branch of the service, should be taught a different method of performing the same drill or evolution, from that in another branch; on the contrary, the two methods should be brought into accord, so far as conditions permit, not only for the sake of flexibility and to promote cooperation when in company, but so that men honorably discharged from one branch of the service may enter another, without having to unlearn what has been already acquired.

In the revision of the Landing-Force Manual, 1918, *infantry drill and tactics* were brought into accord with the Infantry Drill Regulations, U. S. Army; the *infantry organization* was changed to correspond with that of the Army; and the *organization*, *drill*, *and tactics for artillery and machine guns* were based on those of the infantry. The principal changes from the revision of 1918 are as follows:

Infantry.—Although the revision of 1918 was based on the Army Drill Regulations there were numerous points not covered in that revision. It has been the aim of the present revision to eliminate all points of difference and to bring these Regulations into more strict accord with the Army. With that end in view, the *platoon* has been made the unit of organization and Army practice followed throughout. The organization of the *squad* has been modified to cover the employment of grenades and automatic rifles. In a few instances amplifications of the Army Regulations have been included for the sake of *clearness*, but these changes do not constitute a departure from Army practice.

The Organization of the Landing Force has been revised to comply with the requirement that the platoon is the "unit of organization."

The chapters on (a) **Interior guard duty, security, and information**; (b) **marching, camps, and billeting**; (c) **special operations**; (d) **field engineering**, have all been revised to conform to the experience gained by the American Expeditionary Force in the World War. New chapters on **offensive combat** and **defensive combat** taken from the regulations of the American Expeditionary Force have been added and constitute material not previously covered in detail.

Arrangement.—The book has been divided into two parts.

Part I covers the general principles of land warfare together with the tactical uses of forces on shore.

Part II covers the details of training individuals in infantry, artillery, and other drills corelated thereto; it also covers the rules and regulations governing the handling of tactical units constituting land forces.

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ABBREVIATIONS.

bg. c	Brigade commander.
bg. adj	Brigade adjutant.
bg. sf	Brigade staff.
bg. sur	Brigade surgeon.
bg. qm	Brigade quartermaster.
bg. c. p. o	Brigade chief petty officer (brigade sergeant major).
bg. sf. p. o	Brigade staff petty officer (brigade noncommissioned staff).
rg. c	Regimental commander.
rg. s. c	Regimental sub-commander (lieutenant colonel).
rg. adj	Regimental adjutant.
rg. sf	Regimental staff.
rg. sur	Regimental surgeon.
rg. qm	Regimental quartermaster.
rg. c. p. o	Regimental chief petty officer (regimental sergeant major).
rg. sf. p. o	Regimental staff petty officer (regimental noncommissioned staff).
bn. c	Battalion commander.
bn. adj	Battalion adjutant.
bn. sf	Battalion staff.
bn. sur	Battalion surgeon.
bn. qm	Battalion quartermaster.
bn. c. p. o	Battalion chief petty officer (battalion sergeant major).
bn. sf. p. o	Battalion staff petty officer (battalion noncommissioned staff).
c. c	Company commander.
pt. c	Platoon commander (officer or warrant officer).
pt. l	Platoon leader (petty or noncommissioned officer in charge of a platoon).
c. p. o	Chief petty officer (first sergeant).
1. p. o	First petty officer (sergeant).
2. p. o	Second petty officer (corporal).
p. o	Petty officer (noncommissioned officer).

PART I.

CHAPTER I.

THE LANDING FORCE.

Sec. I.—ORGANIZATION.

1. **Each ship, division, and fleet** shall maintain a permanently organized landing force, consisting of infantry, artillery, and other units, as hereafter provided. The organization will be flexible, so that all or any part may be landed, at the discretion of the senior officer present.

2. **The unit of organization is the platoon.**—A landing force company, whether of infantry or artillery, should if possible consist of four platoons. For infantry, platoons should consist of six squads each, for artillery of four squads each. Each company; whether of infantry or artillery should have a squad of special details, which, when not combined in the battalions, muster and mess with the company. For further detail see arts. 1584 et seq., art. 1661 et seq., and art. 1785 et seq.

3. **The ship's landing force** varies in size and composition, according to the type of ship. For a ship of the first rate it consists normally of two platoons of marines (infantry), one company of bluejacket infantry, two platoons of bluejacket artillery, and special details. This constitutes a **ship's landing force**, but when landed as part of a fleet organization it is subject to reduction, due to combination of marines or artillery into separate units of those branches. When the nature of the service is such that artillery will not be required, the artillery platoons may be landed as infantry.

4. (1) **The battalion** consists of not less than two nor more than four companies. When, due to combination of marines or artillery into separate units, a ship's landing force would become reduced to one company, adjacent ships will be required to combine to form a full sized battalion of four companies.

(2) **The regiment** consists of from two to four battalions.

(3) **The brigade** consists of two or more regiments.

(4) Whether serving as infantry or artillery the organization is identical.

5. **The maximum force.**—Where otherwise desirable and the number of men permits, the number of companies may be increased by adding additional companies of bluejacket infantry to each ship's force; but enough men shall always be left on board to care for the ship, to use the battery, and to move the engines as may be required by the existing conditions of weather or service. Not more than one-half of the combatant force shall be landed at any one time.

6. Whatever the plan of organization adopted for the division and fleet landing forces, it is important that it be made as nearly permanent as possible, complete in all its details, and that units be definitely assigned, in order that all concerned may become familiar with their duties before the actual time when the landing force may be required. This is especially true of the detail of staff officers, and for the larger as well as the smaller units.

7. **Marines.**—For parades and ceremonies the marines will be placed on the right of the line in their battalion, regiment, or brigade, according to the method of organization. In actual operations on shore they will be placed where directed by the officer in command of the forces; and in mixed detachments or forces, composed of seamen and marines serving on shore, the senior line officer of the Navy or of the Marine Corps shall command the detachments.

The titles of brigade, regimental, battalion, and company officers, and noncommissioned officers of marines, shall remain unchanged.

Organization of the Staff.

8. All military units larger than a company have headquarters and staffs. Their duties are both tactical and administrative.

9. The commander of a landing force concerns himself with the broad questions of strategy and military policy. He is assigned such a staff as is necessary for the discharge of his duties. The commander may detail additional staff officers when necessary, but a bulky staff implies a division of responsibility, slowness of action, and indecision, whereas a small staff implies activity and concentration of purpose.

10. Whatever its composition, the sole purpose of the staff is to assist the commander in his mission. The acme of staff service is reached when, under the direction of the commander, and with the minimum of friction, discomfort, misunderstandings, and loss for the units of the command, that mission is achieved.

11. (1) In order to provide the necessary command and staff service, every ship of the fleet will organize a staff for service with

the landing force. Except for flagships, or where otherwise directed, the organization is that of a battalion staff. Their duties are restricted to service with their own landing force battalions, or the battalions of the landing force regiments. Division flagships provide also the additional details to complete a regimental staff. When the landing force battalion of a division lands independently, its staff is provided normally from the regimental staff. The brigade staff is similarly provided by the fleet or force flagship.

It will be noted that while some ships must organize various headquarters detachments, they are not, as a rule, required simultaneously, and the officers, petty officers, and men from the larger staffs afford material from which the smaller units are supplied.

(2) Battalion, regimental, and brigade commanders will be designated by the division and fleet or force commanders. Staff officers are similarly designated; this should be, as far as practicable, on the recommendation of their respective chiefs.

Duties of the Staff.

12. The duties of the various members of the brigade staff are also performed, as far as they are applicable, by officers on similar detail in the regiment and the battalion.

When operating independently, or on detached service, the commanding officer of a regiment, battalion, or detachment performs the duties prescribed for the chief of staff with reference to the specific mission on which he is engaged.

13. The chief of staff is the senior assistant and military adviser to the brigade commander. He has general supervision over the instruction and training of the command and of its operations in the field.

He is responsible for the preparation of plans of operations, combats, and movements; the preparation of field orders and war diaries. (See Arts. 92 et seq. and 584 et seq.)

He keeps the commander informed with regard to the strength, distribution, morale, movements, and reenforcement of the troops.

He is in charge of the relations with the civil authorities and inhabitants of the occupied territory.

He exercises control over the radio, telegraph, telephone, and cable communications, and the coding and decoding of messages and orders.

He organizes the intelligence and information service. Such officers and enlisted men as are suitable are detailed for this duty, and every effort is made to obtain reliable service from friendly civilians. He causes a daily report of all information received from the various sources relating to the intelligence service to be made for the information of the brigade commander.

He has supervision over the censorship of mails and other methods of communication, and over newspaper correspondents.

14. (1) **The adjutant** is senior assistant to the chief of staff.

He is in charge of the interpreters, guides, and translators.

He is chief signal officer of the brigade, and exercises supervision over the establishment of signal stations and wire and radio communication. He is assisted by regimental and battalion signal officers.

He is the medium of communication in sending and receiving flags of truce and any other communication with the enemy.

(2) The adjutant is responsible for the custody of all headquarters files and records.

He issues all routine orders, circulars, and memoranda.

He is the medium of communication between the commanding officer and all units of the command.

He causes the rosters (for guard, fatigue, and other duties, see Art. 107 et seq.) and consolidated reports of strength and distribution of the command to be properly kept. (Art. 529, last paragraph.)

He supervises the preparation of all letters and other official correspondence. He is authorized to sign "By direction" all orders and communications whose destination is within the command of his chief.

(3) The duties prescribed under paragraph (2) relate specifically to regimental and battalion adjutants. The adjutants of subordinate units do not perform the duties prescribed in paragraph (1), except such as relate to their duties as signal and intelligence officers under the brigade adjutant.

15. **The paymaster** is in charge of the pay of the personnel and general disbursements, and the settlement of reimbursement claims. He is in general charge of the distribution of rations and commissary supplies and of messing arrangements.

16. (1) **The quartermaster** is the brigade pioneer officer. He is in charge of labor, roads, bridges, and the maintenance and operation of railways.

He has charge of surveys, preparation, and distribution of maps and organization of map-making details.

He has supervision over military engineering operations, the construction of fieldworks and lines, and demolitions.

He is in charge of all transportation facilities, and light and power plants.

He provides offices, quarters, forage, fuel, and water as may be required.

He makes provision for the ammunition supply, and keeps, for the information of the commanding officer, a report, showing amount of ammunition, tents, and other equipment on hand.

He provides equipment and camp equipage as may be obtainable from the reserve supply of the ships of the fleet, to supply any shortage that may occur in the landing force.

(2) Quartermasters of subordinate units perform such of the above duties as are applicable. They supply the brigade quartermaster with all information and assistance as necessary to aid him in the efficient performance of the duties assigned his department. Subordinate quartermasters are also the commissary officers of their units, and aid the brigade paymaster in the messing arrangements and ration supply of the command.

(3) When an **artillery liaison officer** is attached to the brigade staff, he may be assigned such duties relating to ammunition supply, including artillery ammunition, the supply and repair of field and machine guns and small arms, as do not interfere with his duties as adviser to the brigade commander on the employment and disposition of the artillery.

17. The surgeon is responsible for the regulation of the sanitation of camps, quarters, and occupied territory.

He is charged with the health of the command, the care of the sick and wounded, and their collection and transfer when necessary.

He has general supervision over the medical personnel and ambulance parties.

He takes the necessary steps for the disinfection of clothing.

He keeps the commanding officer advised with regard to the necessary sanitary measures, quarantine service, and hygiene.

He furnishes the commanding officer daily with a report showing the list of sick and wounded and others incapacitated for military service.

He is the survey officer for food and rations unfit for issue.

18. The aides when not on duty directly under the brigade commander are assigned as assistants to the chief of staff and the brigade adjutant respectively.

The aide in personal attendance on the brigade commander will keep the chief of staff informed of any contemplated movement of the brigade commander.

When orders or instructions are issued during the absence of the chief of staff, the aide in attendance will make a written copy of the order and send it without delay to the chief of staff.

19. **The bg. c. p. o. and staff p. os.** are the assistants to the staff and perform such duties as may be assigned them.

The bg. c. p. o., under the adjutant, has general charge and supervision over all the p. os. and men of the headquarters detachment.

20. The headquarters details for the marine battalions and regiment of marines are made from the Marine Corps personnel. Medical officers and members of the hospital corps of the Navy are assigned as for other landing force units.

21. The assignment of officers of proper rank for command and duties is as follows (marine officers are of corresponding rank):

Rear admiral,	Bg. c.	Lieutanant,	Rg. adj. Rg. q. m. C. c.
Captain,	Bg. c. Chief of staff. Rg. c.	Lieut. (J. G.),	Bn. adj. Bn. q. m. C. c. Pt. c. Aide.
Commander,	Chief of staff. Rg. c. Rg. s. c.	Ensign or warrant officer,	Bn. q. m. Pt. c.
Lieut commander,	Bg. adj. Bg. q. m. Rg. s. c. Bn. c.		

An officer of the pay corps is detailed as brigade paymaster and commissary. When desirable, pay clerks may be detailed for similar duty with battalions.

The Colors.

22. One set of colors only shall ordinarily be carried by each regiment. In a mixed force, where the artillery is not organized into a regiment, the colors shall be carried by the infantry. In street parades, however, and when battalions are acting independently, each battalion may be permitted to carry its colors. The term "colors" is applied to the national flag if carried alone; but it includes the regulation regimental or battalion flag also if the latter is carried. (See Art. 2250 et seq.)

Sec. II.—SPECIAL DETAILS.

23. (1) **The special details** accompanying a landing force comprise **pioneers, signalmen, cooks, ambulance party,** and **officers' servants.**

(2) Any or all of the special details may be massed in each battalion, regiment, or brigade under the proper staff officers.

24. The organization of the special details is a matter of the first importance. The number of men assigned to these duties, and their equipment, depends largely upon the circumstances of the service in any case; it is impossible to anticipate all conditions and necessities in these regulations.

25. During an engagement, in order to reduce the number of ineffective men to a minimum, the messmen, servants, and others who are not actually engaged in their own legitimate duties shall be employed to reenforce the stretchermen. They should recover the arms and ammunition of disabled men, and perform such other duties as the commanding officer may direct. Those who assist the stretchermen should lay aside their arms and wear the red cross badge.

Pioneers.

26. (1) The pioneers, consisting ordinarily of two men for every company landed, will carry as complete an outfit of intrenching and carpenter's tools as the conditions of the service and the facilities for transportation will permit.

When desirable, the pioneers may be supplied with explosives for demolition work. Sketching outfits may be added if the pioneers are qualified for map making.

(2) Circumstances must largely determine the duties of the pioneers in any case. They may precede the main body with the advance guard to clear away obstructions and entanglements and repair bridges and roads. In camp they may assist in constructing defenses and entanglements and making gun emplacements..

In retreat they may operate with the rear guard in blowing up bridges, buildings, and fortifications, in destroying guns, planting mines, and obstructing pursuit.

27. The pioneers are in charge of the brigade, regimental, and battalion quartermasters, who are responsible for their training, organization, and equipment. One petty officer is included with each detachment of eight pioneers landed. If formed into a company, the organization is the same as for infantry; the proper quota of officers and petty officers being detailed for duty with the pioneer company.

28. Electricians, locomotive engineers, and other special men who may be needed in some cases to take charge of electric plants or railroad property on shore, may be added to the pioneers. Such men are always available in a ship's company.

Signalmen.

29. Duties.—Ordinarily signalmen will be detailed in accordance with the number prescribed in Table "A." Provision is made for **company** signalmen who constantly remain with the companies to which attached, and **headquarters** signalmen, which are attached to each battalion, regiment, and the brigade.

In addition to the duty of making necessary signals, these men should be able to take charge of telegraph and telephone lines when necessary. A signal quartermaster will be detailed as leader of the signalmen of each regiment and of the brigade.

30. Signal outfit.—Each signalman should carry hand flags for day signals, and the party should have the necessary night signal outfit. The following articles also should be supplied:

Compass.
Binoculars.
Spyglass.
Pencils.
Lanterns.
Memorandum books.
Message blanks.
Deck and Boat Book.

A pair of climbing irons will be of use to signalmen, who may obtain and communicate information by climbing trees.

31. **A telescope** of high power, mounted on a tripod, should be supplied if possible for the use of the headquarters signal stations of the regiments and of the brigade.

32. **A radio outfit**, and the necessary personnel, will be useful for brigade headquarters.

Field radio sets, when obtainable, are excellent for this purpose, and their employment by organizations on detached duty greatly facilitates the prompt and efficient performance of simultaneous operations in the field.

Ammunition Supply.

(See Art. 796 et seq.)

33. Spare ammunition.—In case a large supply of spare ammunition must be carried, **special means should be supplied for its transportation**, especially in hot climates. Native carriers or pack animals should be obtained, if possible. Poles about six feet long for each pair of carriers may be useful to sling a box of ammunition.

Commissariat.

34. Cooks, messmen, and officers' cooks and servants will be detailed in accordance with Table "A," or as may be required.

35. In the field it will ordinarily be found most satisfactory to organize company messes. When desirable a p. o. is detailed as petty officer in charge of the mess; he is in general charge of the cooks and messmen. The first cook is responsible for the care, preservation, and cleanliness of the cooking utensils and mess outfit of the company.

The c. c. is primarily responsible for the proper rationing and serving of food to his company; every meal should be inspected either by the c. c. in person or by one of the junior company officers.

36. The brigade and regimental staff each have a separate mess. A battalion mess for the bn. c., staff and company officers, is maintained in each battalion; but company officers may, if desirable, have separate company messes.

When all the officers of a battalion have a single mess, company servants are attached, in addition to their other duties, to the mess and aid in the preparation and serving of the meals.

37. Staff petty officers, orderlies, and other details attached to headquarters, are evenly distributed among the company messes for rations.

When any special detail is organized into a separate company, such as a pioneer or machine gun company, it is rationed and messed as for a regularly organized company.

38. Provisions.—(1) The quantity and kind of provisions will depend upon the nature and length of service, distance from the base, and upon the probable supplies obtainable in the field. **A part or all of the Navy ration may be used.**

(2) The following limited table of rations is suggested as suitable for brief tours of duty on shore:

Articles per 100 rations.

	Pounds.		Pounds.
Hard bread	100	Coffee, roasted and ground	8
Corned beef [1]	75	Sugar	15
Beans, baked [2]	45	Milk, evaporated, unsweetened	4
Tomatoes, canned [2]	75	Salt	1
Jam	9	Pepper	[3]4

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[1] Or corned beef, 50 pounds, bacon, 25 pounds.

[2] Or 125 pounds of potatoes, Irish or sweet; or 25 pounds of tomatoes, or other vegetables, and 100 pounds of potatoes.

[3] Ounces.

39. **An emergency ration** for two days' service may be issued to each man, and carried in the haversack.

40. **Cooking utensils.**—Boat-stoves will be carried if practicable. They are not indispensable, however, as fireplaces can be built with ease. Kettles of different sizes are specially useful. Frying pans and broilers are very necessary. Cooking utensils must be kept scrupulously clean. When the force is to remain near the ship, or whenever transportation is available, an ample supply of utensils should be carried. Circumstances must govern in each case. The list of utensils furnished with the field range (Donavin type), Art. 101, indicates what articles may be supplied, when practicable.

A liberal supply of matches should be carried. They should be stowed in tight tin boxes kept free from moisture, and should be expended economically.

41. **Water allowance.**—Two quarts per day is a short allowance for cooking and drinking. A gallon per day is a reasonable allowance, and when there is a plentiful supply the men should be allowed about 4 gallons per day for drinking, cooking, and washing.

42. **Cold tea and coffee.**—When authorized, the men may fill their canteens with cold tea or coffee.

Ambulance Party—Hospital Staff.

43. **The ambulance party** of each battalion will be composed, ordinarily, of two stretchermen for each company, with a hospital steward and as many hospital apprentices as the circumstances may demand. One stretcher will be provided for each pair of stretchermen. The necessary medical and surgical outfits will be prescribed by the surgeon.

44. **Base hospital.**—In case a base hospital is to be established on shore, it will be under the personal charge of the bg. sur. who will advise the bg. c. regarding the organization of a separate hospital staff independent of the ambulance parties.

45. **A ship as base hospital.**—A ship will be used as a base hospital whenever practicable, and the sick and wounded will be sent on board as promptly as possible, in order to relieve the field-hospital force and to avoid hampering the movements of the landing force.

46. **During an engagement** the following general plan will be carried out:

(1) The bg. surs. will select one or more dressing stations under cover, about 300 yards in rear of the firing line.

(2) The bg. sur. will establish one or more field hospitals at convenient points where water and shade are available, if possible.

(3) Men seriously wounded will first be carried to the dressing stations and later to the field hospital; the slightly wounded will find their own way to the hospital or will return to the firing line as directed by the surgeon.

(4) Men will be transferred from the field hospitals to the base hospital as soon as practicable.

(5) All officers and p. os., and as far as possible all men, will be supplied with **first-aid packages** and be instructed in their use. (See Art. 1312.)

47. **Distant service.**—Special arrangements must be made for the transport of the sick and wounded in the case of distant expeditions and long marches.

Arms.

48. **Officers.**—At parades and ceremonies and at ordinary infantry and artillery drills on shore, officers will wear swords only. **At practical exercises with the landing force on shore officers will carry pistols and binoculars and omit the sword.**

49. **Petty officers.**—The bg., rg. and bn. sf. p. os., c. p. os., color bearers, headquarters signalmen, and buglers will wear pistols at all drills and ordinarily on active service on shore.

Sergeants major of marines and first sergeants of marines in charge of companies will ordinarily be armed with noncommissioned officers' swords in lieu of pistols, except at practical exercises with the landing force or when on active duty in the field.

50. **Special details.**—All the special details, except the ambulance parties, will, ordinarily, be armed with the rifle.

51. **The ambulance party and Hospital Corps men** will, ordinarily, carry no weapons, but will wear the Geneva cross on the left arm. **Against a savage or uncivilized enemy,** however, the men of the hospital staff and ambulance party will carry pistols and omit the red cross.

52. **Surgeons** will wear swords at parades, ceremonies, and ordinary drills. On active service and at practical exercises with the landing force they will observe the rule for the hospital staff.

53. **Boat keepers** will be armed with rifles.

54. **Infantry and artillery companies** are armed with rifles, and two machine guns per company are also carried, when necessary, by designated companies. When artillery companies are permanently organized, and where duty away from the piece is improbable, the gun squad may be armed with the pistol.

55. Servants.—If armed at all, servants will carry pistols. The commanding officer will give directions, as circumstances may require.

56. Fully equipped.—When fully equipped, officers will carry:

Pistol and ammunition.
Canteen.
Haversack (containing mess gear).
Field glasses.
Watch.
Whistle.
Pocket compass.
Blanket roll (containing extra clothing).
Map case (maps, pencils, blanks, notebook, etc.).
First-aid package.

The articles of equipment will be carried as follows:

(*a*) Pistol in holster, the holster being attached to the belt at the point of the right hip, with the lower end of the holster strapped to the right leg.

(*b*) Extra magazine clips will be carried in pockets just to the left of buckle.

(*c*) Canteen attached to the belt just to the right of the middle of the back.

(*d*) Haversack attached to the belt with the right snap hook attached at the middle of the back, the other snap hook as far to the left as necessary to secure a good fit.

(*e*) First-aid package attached to the belt just to the right of the buckle.

(*f*) Field glasses in case with strap over right shoulder and under belt, bringing the case close up under the ammunition pockets to left of buckle.

(*g*) Whistle on a lanyard around the neck. Pocket compass in any convenient pocket.

(*h*) Map case (containing maps, blanks, pencils, etc.), on a strap over the right shoulder, bringing the case over the left hip; to be worn when the nature of the duty so requires. When the map case is not carried, pencils, paper, blanks, etc., may be carried in the haversack.

(*i*) The blanket will be rolled, secured with tie-ties, and placed on the right shoulder with the ends of the roll fastened together under the left arm. When so desired the poncho may either be worn or rolled outside the blanket for protection. The following articles will be carried in the blanket roll:

1 pair shoes.
2 pairs socks.
1 suit underwear.
1 shirt.
1 trousers.
Toilet articles.

57. **Lightly equipped.**—When lightly equipped the blanket roll and the haversack will be omitted.

58. (1) **Extended operations.**—When more extended operations are contemplated (three to six days), officers will take ashore with them the regulation pack complete. In order to permit greater freedom of movement on the part of officers, the pack will seldom be carried by the officer himself unless no other transportation is available. Officers' packs will, as a rule, be carried with the company, battalion, or regimental stores. Orderlies may be detailed to care for them.

(2) When operations are expected to cover a period greater than one week, or landing forces are to operate from a base ashore, either on the coast or in the interior, the following baggage allowances are authorized, such baggage to be transported with the supply column of the organization to which the officer is attached and to be plainly marked with the officer's name and organization:

(*a*) Company officers and battalion staff: 1 bedding roll, 1 clothing roll, 1 trunk locker not to exceed 6 cubic feet outside measurement.

(*b*) Battalion commanders and regimental staff officers: same as under (*a*), and in addition 1 more trunk locker of same size as specified above.

(*c*) Regimental and brigade commanders and brigade staff officers, same as under (*a*) and in addition 2 more trunk lockers of the same size as specified above.

59. **Overcoat and sword.**—When overcoats and swords are worn, officers will wear the scabbard outside the coat, with the short sling passing through the side slit, and the long sling through the back slit.

60. Useful articles.—The following additional articles should be carried, if possible, by officers on active service:

Landing-force Manual.
Gun oil.
Maps.
Electric hand torch.
Knife.
Sewing kit.
Scissors.
Toilet articles.
Hand mirror.
Rubber basin.

61. Officers' clothing.—(1) The clothing to be worn or carried by officers will depend upon the climate and other circumstances of service, and must be limited in amount.

(2) White shoes will never be worn with leggings.

(3) A change of underclothing, two pairs of socks, one towel, a blanket, and an extra pair of shoes at least should be carried. No linen should be worn. Flannel shirts are preferable.

62. Transportation, or special carriers, shall, if possible, be provided for the officers' clothing and mess outfit.

When no other transportation is available, the servants or carriers of the several companies may work in pairs, each pair being provided with a light pole to be carried upon their shoulders: one pack may then be suspended in front of the leading carrier, one in rear of the rear carrier, and others on the pole between the two.

(2) Under exceptional circumstances officers will be required to carry their own packs.

(3) Officers will soon determine which articles to carry on their persons, and which to stow for transportation.

Men's Equipment and Clothing.

63. Fully equipped.—The equipment will depend upon the circumstances of service. When **fully equipped** each man will carry pack carrier, packed, and haversack, rubber blanket, and cartridge belt, filled canteen, and leggings. (See art. 2208 and figs. 194 and 195.)

There is no provision for carrying the overcoat on the pack. When weather conditions make it necessary to carry the overcoat it will have to be worn.

The haversack will contain rations, knife, fork, spoon, meat can, bacon can, and condiment can. Also, a towel, soap, comb, toothbrush, tooth powder or paste, sewing kit, matches; and tobacco and pipe if desired.

When pack carriers are not provided, the most necessary of the above-mentioned articles will be carried in the blanket, neatly rolled lengthwise and stopped, the roll placed over the left shoulder, with both ends of the roll secured together under the right arm as described for an officer.

64. Lightly equipped.—When lightly equipped, men will carry filled canteens and cartridge belt and wear leggings. The pack carrier with haversack may be prescribed if circumstances require it.

65. The canteen complete includes the canteen, cup, and felt-lined canvas cover. These articles are always intended to be included, when it is prescribed that the canteen will be carried.

Sec. III.—PREPARATIONS FOR LANDING.

66. The decision to land troops and the method of landing should be the result of a proper *estimate of the situation*, having due regard to the opposing enemy forces, the object to be attained, and the force available for attaining it. The preparations to be made prior to landing fall practically under three heads: I. Information; II. Preliminary measures; III. Orders for the landing.

I. Information.

67. Under this head should be considered:

(1) The strength and fighting capacity of the enemy.

(2) His organization, arms, artillery, etc.

(3) Number and location of his fortifications or defenses.

(4) The terrain in which operations are to take place, the roads by which to advance, and the distance.

(5) The probable resistance to be encountered, and the probable tactics of the enemy.

(6) The accessibility and suitability of various landing places, and whether, and to what extent, the operations on shore can be facilitated by fire from the ships.

(7) The availability of transportation facilities (including water transportation) after landing.

(8) The probable length of time the force will remain on shore, and the nature of the service.

II. Preliminary Measures.

68. Under this head the following should be covered:

(1) Decide upon the strength of the force to be landed, what units of the various branches are to compose it, and what ships are to furnish them, and what equipment is to be taken.

(2) Decide upon a base, and if necessary or desirable send ships to seize and fortify it.

(3) Decide upon a **landing place** and reconnoiter it. In fixing the time and place of landing the following points should be considered:

(a) The landing place should be under a lee if possible, and should be selected with reference not only to an advance, but in anticipation of a possible retreat or return to the boats.

(b) The beach in the vicinity should not afford cover for an enemy.

(c) The rise and fall of the tide must be noted, and a place selected where the boats can run close in and land their troops quickly.

(d) There should be good holding ground for covering-ships to anchor, or safe ground for them to maneuver during the landing.

(4) Make calculations regarding ammunition, equipment of all kinds, and provisions and water, for the first landing, and on a per diem basis thereafter.

(5) Make arrangements to keep the force supplied with provisions, water, and ammunition, and for keeping open a line of communications.

(6) Prepare plans for signal or other communication between the landing force and the ships.

(7) Obtain maps covering the area of operations, and make provision to furnish copies to all organization commanders. If no maps are available, necessary steps must be taken to map the area of operations, as far as possible, before the landing. In large cities and towns, maps usually exist and can be obtained.

(8) Make arrangements for the care of the sick and wounded.

(9) Obtain necessary transportation, utilizing water transportation and native carts, teams, etc., as far as possible.

III. The Orders for Landing.

69. The orders for landing (see Combat orders, Arts. 584 et seq.) should cover all possible details of the organization, equipment, landing, and the service to be required:

(1) **Organization.**—What units of infantry, artillery, and other branches will land; what ships are to furnish these units, how they are to be organized, and who is to take command of the operations on shore; what companies, if any, are to take machine guns

(2) **Arms and equipment.**—The uniform, arms, and equipment of the men (Arts. 49 et seq. and Arts. 63 et seq.), and the ammunition, provisions, and water they are to carry; whether the extra clothing in their packs will be blue, white, or field.

(3) **Equipment of officers.**—The uniform, arms, and equipment of officers (see Arts. 48 and 56 et seq.), and whether or not their baggage will be transported for them.

(4) **Special details.**—The organization, arms, and equipment of the special details, servants, and other special men as may be required by the circumstances.

(5) **Boats.**

(a) The assignment of the landing force to the boats, and any special equipment the boats are to carry, such as a means for stopping shot-holes or buckets for bailing.

In assigning the force to boats, units should, as far as possible, be kept intact; i. e., whole companies or platoons in a single boat. If the oars are to be used, there should be in each boat sufficient men qualified to handle them. Within each boat squads should be seated together as far as possible.

(b) The assignment of **field artillery** to boats, for transportation ashore. The heavier launches will be used for this purpose. Field artillery is not suitable for firing from boats.

(c) What boats are to mount **boat guns and machine guns**, for assistance in covering the landing; preferably leading or flanking boats.

(d) Boats for supplies and equipment, provisions, and water, reserve ammunition, etc., and whether it is to be landed with the force or afterwards.

(e) Boats for **ambulance-party**, with the medical officer and assistants; light fast-pulling boats, flying the red cross flag.

(f) Boats for **special details.** The special details will, if practicable, be grouped together in their own boats, especially if the landing is likely to be opposed. Circumstances will determine whether the noncombatant special details, such as cooks and officers' servants, will be landed with the force or afterwards.

(g) **Boat keepers** will be detailed as follows: Whaleboats, one; cutters, two; launches, three or four as necessary.

(6) **Formation and landing.**

(a) The rendezvous of the flotilla, and its formation. Where no other formation is prescribed, it will be in line of columns.

(b) The maneuvering of the flotilla, and the time, place, and manner of landing.

(c) If opposed, whether the men are to land with their full equipment, or only with rifles, ammunition, and canteens; their other equipment being sent to them after the landing is effected.

(7) **Beach master** and his assistants, and their duties in detail as to the management of the boats, the disposition of the stores and material, the protection of the landing place, and the preparations for reembarking the force.

(8) **Stores and supplies.**—The quantity of provisions, water, and other stores, reserve ammunition, and equipment to be assembled

for the landing force; how much of this is for immediate landing, and how much to be sent ashore later.

(9) **Covering ships.**—Positions and duties of the covering ships, and the points against which they are to direct their fire. The distances of conspicuous objects, or of cover for the enemy, should be known or measured beforehand, if possible. The positions chosen should be such as to cover the landing place, and any possible points from which hostile fire may be directed, especially artillery fire.

Lookouts, with glasses, should be sent aloft on all ships to scan the beach, and to report, not only to the ships, but to the landing force, the positions and movements of the enemy before, during, and after the landing.

(10) **Communications.**—The method of communicating between the landing force and the covering ships, and with the ships after the force is landed.

(11) **General remarks.**—(a) In the orders for landing outlined above, all points are considered in their proper sequence, and the general outline should be followed, for the sake of uniformity.

(b) Additional necessary measures, not covered above, should be inserted under their proper heading.

(c) All officers, to and including company commanders, should be furnished with copies of the landing orders, with a view to expediting preparations, insuring cooperation, and eliminating unnecessary messages and signals.

(d) Maps, and such other information as may be necessary to the intelligent and vigorous performance of their duties, should be furnished to those concerned.

(12) **Special instructions.**—The officer commanding the force should be given instructions as to the discretion he may use in the advance, and in the operations after landing is effected.

Final Inspection.

70. (1) **Personnel.**—The different units of the landing force having been equipped in accordance with the orders, should, if practicable, be assembled for a careful muster and final inspection before landing.

(2) **Matériel.**—(a) All matériel, ammunition, stores, etc., should be collected, checked, and inspected preparatory to landing.

(b) Careful and complete lists of all kinds of matériel will be taken by the officers, and every preparation made for its proper distribution and expenditure, so that the amount on hand shall be known at all times, and requisitions be prepared to anticipate future needs.

Sec. IV.—THE EMBARKATION AND LANDING.

71. **The embarkation.**—At the appointed hour, after all ships have signalled that their forces are in readiness, the commander in chief makes the necessary signals for the covering ships to take their positions and for the force to embark.

72. **Each ship's landing force embarks** in the boats assigned, and forms column (or columns) on the starboard (or port) beam, in the following order: Steam launches, motor sailing launches, sailing launches, cutters, and whaleboats. The battalion commander, in the leading boat, takes the other boats in tow, assisted by the oars, if necessary, and proceeds to the rendezvous.

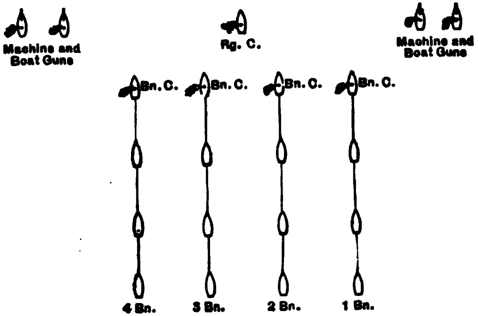

FIG. 1.—Line of columns.

The Flotilla of Boats.

73. After each ship's force has arrived at the rendezvous, any further redistribution of boats necessary to carry into effect the prescribed organization and formation is accomplished, and the flotilla is formed. The normal formation will be that of **line of columns**, each bn. c. towing the boats of his battalion.

Boats mounting machine guns and boat guns will be leading or flanking boats, preferably other than those used for landing the force.

74. **Whistle signals.**—The following whistle signals may be used, where not likely to give the alarm to the enemy:

(1) When taking the boats in tow, after straightening out the tow lines:

Three blasts, stand by to boat the oars.

Two blasts, boat the oars.

(2) Being in tow, preliminary to disembarking:

Three blasts, stand by oars and prepare to cast off.

Two blasts, out oars.

One blast, cast off.

75. Maneuvering the Flotilla.—The flotilla, in line of columns or other formation, is maneuvered by order or signal of the rg. or bg. c., depending on the size of the force, the prescribed method of landing, and the resistance encountered. It will not normally be formed in line until just prior to landing, as that formation is unwieldy.

The Landing.

76. A landing force can not land where the beach is defended by effective artillery fire. This fire must be silenced by the fire of the covering ships before the landing is attempted. If the covering ships are unable to accomplish this, it will usually be better to change the place of landing and attempt to capture the position by a flanking movement.

77. If the beach is defended by riflemen, boat and machine-gun fire will be of great assistance, especially that from the flanking boats, which subject the enemy's position to crossfire.

78. As it is impracticable to deliver effective rifle fire from boats, the main body of the landing force is held beyond effective range of the enemy until the fire of the defenders has been silenced or at least partially reduced.

79. It is impracticable to prescribe an exact formation for landing. In general, the plans follow, as far as possible, those of an infantry attack on shore. The artillery and supply boats, as also the ambulance boats, are held in the rear until the landing is effected. Certain companies or battalions of infantry may be designated to land first and form a firing line, the other companies or battalions being held in reserve. Or, depending on circumstances, all of the infantry boats may rush the beach at the same time.

80. Immediately after landing, each company of the firing line deploys at once, and makes a rush for such position or positions as may have been designated by the c. c. prior to the landing, utilizing such cover as may be available.

81. After the landing has been effected, the landing force is handled and maneuvered in accordance with the demands of the tactical situation, the mission to be accomplished, and the principles of land warfare. (See Part I, Chap. IV).

Precautions After the Landing.

82. **Patrols.**—If the landing has been unopposed, or when opposition ceases, specially instructed patrols are sent out at once in all directions to obtain contact with the enemy and report, or signal, information. This precaution must always be taken, whether the force is to advance or to remain at the place of landing. (See Art. 388 et seq.)

83. **Outposts.**—If the force is not to move, outposts shall be established without delay, and every precaution shall be taken to meet an attack. (See Art. 303 et seq.)

84. **Advance and rear guards.**—If the force is to advance after the landing, the necessary advance and rear guards shall be formed immediately, and the special patrols shall be instructed as to the route to be followed, that they may keep in touch and transmit information promptly. (See Art. 412 et seq.)

85. **Beach-master and Boat-keepers.**—(1) If the boats are to return to the ship after the landing, the beach-master will direct the boat-keepers to haul their boats off, and he will have them taken in tow and sent back to the ships.

(2) In case the boats are to remain at the landing place, the beach-master will have them hauled off and anchored with stern-lines to the beach, or properly secured at the landing place, in readiness for the prompt reembarkation of the force.

86. **To defend the landing place.**—The beach-master and boat-keepers will be employed, as far as possible, to place the beach or point of landing in such condition as to secure it against attack. A detachment from the landing force may be detailed to assist, or additional men may be sent from the ship, if necessary.

87. **Signals.**—At all times a bright lookout must be kept for signals both afloat and ashore. A signal station, visible from the ships, should be selected at or near the landing place.

Reembarkation.

88. **The return or retreat** of a landing force must be carefully anticipated and provided for. In general, the reembarkation will be conducted in the reverse manner to the landing:

(1) The covering ships will be signaled from time to time, in order that they may use their guns if necessary, and covering boats, with machine and boat guns, will be stationed.

(2) Under cover of a strong firing line, the main body of the infantry and artillery will embark and pull well clear of the beach or landing, assisted by machine and boat gun fire upon the flanks of the position.

(3) The firing line will retire slowly, keeping up a vigorous defense and occupying the cover at the landing place until directed to embark.

(4) The firing line will then embark as quickly as possible and pull away from the landing, under cover of a rapid fire from the ships and from the boat and machine guns.

Information in the Field.

89. Information in the field is obtained from various sources—higher commanders, adjoining troops, inhabitants, newspapers, letters, telegraph files, prisoners, deserters, spies, maps, and reconnaissances. Knowledge of the terrain, always essential to a correct understanding of the situation, is obtained from a careful study of available maps, supplemented by thorough reconnaissance.

All information of the enemy and of the theater of operations is sent to the intelligence section headquarters of the brigade. This section weighs and classifies the information brought in and supervises the preparation of the necessary field maps.

90. In hostile territory influential persons, especially those supposed to be active in the enemy's cause, may be seized and their persons and houses searched. Letters and newspapers in post offices and files in telegraph offices are carefully examined and anything of importance sent to higher authority. Matter not of importance is replaced, if time permits; if not, the whole is sent to headquarters. Local maps of recent date may be of great value.

When reliable information of the enemy can not be obtained, it is assumed that he will act with good judgment.

Information received by any person in the military service, and the action taken thereon, must be promptly reported to the proper military superior.

Unless instructions have been given to spread false information, all persons connected with the military service are forbidden to discuss the military situation, plans, movements, etc., with, or in the presence of, civilians of any age, sex, or nationality.

91. Reconnaissance is the military term used to designate the work of troops or individuals when gathering information in the field. Reconnaissance begins as soon as the theater of possible operations is entered and continues throughout the campaign. No matter what other sources of information of the enemy may be available, reconnaissance must be depended upon to obtain the information upon which all tactical movements of troops should be based.

Records in the Field.

92. Commanders of companies and larger units will keep, or cause to be kept, rosters and other records, sufficient to enable such officer to make a complete report of the operations in which his organization has been engaged, and will keep his immediate superior informed in writing of such routine matters or events of importance as may be required or desirable.

Such communications in the field fall under three general heads: Messages, reports, and war diaries.

93. The term **message** is generally applied to written information sent by messenger or wire. Such messages should be brief and clear, resembling telegrams. The source of the information contained in the messages is always given, the writer carefully separating what he has actually seen himself from that received secondhand. Most of the rules adopted to secure clearness in orders apply equally to messages.

94. A **report** is a more or less formal account of some enterprise, undertaking, or event, such as a march, reconnaissance, battle, etc. A report is usually drawn up at comparative leisure, is often the supplement and expansion of short messages, and thus possesses the value of greater detail.

95. A **war diary** is a record of events kept in campaign by each battalion and higher organization. Entries are made daily and should form a concise history of the military operations. A day comprises 24 hours covered by the date.

Each day's record will commence with a march table, or statement of the operations or location of the organization, including an account of weather, roads, camp, health of troops, etc., and a statement of the supply of ammunition, rations, and forage. This will be followed by a chronological record of events, including time and place of issue and receipt of orders and messages, with a copy or a synopsis of contents.

It is of special importance that the exact hour and place at which movements are begun and ended, and orders or important messages sent or received, be noted. After an engagement, the war diary will contain a report of losses and captures and will be accompanied by a sketch showing the positions of the command at the most important phases.

Each day's record will be attested by the commander or by the adjutant; and, with attached copies of orders and messages sent and received, will be forwarded daily to the next higher commander, who, as soon as practicable after the receipt thereof, will forward the war diary through official channels to the Navy Department (Operations), or headquarters of the Marine Corps.

Sec. V.—TRAINING AND SHORE DRILLS.

96. In order that the landing force may be properly trained, the organized units must be given systematic instruction and drill.

Since the number of shore drills and exercises is necessarily limited, every opportunity should be taken advantage of to impart such instruction as is practicable on board ship. This instruction consists of lectures, practical demonstrations, and exercises.

When properly prepared these exercises are of great benefit to officers and men, and by making them progressive in nature, no difficulty will be experienced in holding the attention and interest of all concerned.

The instruction includes the following:

1. Nomenclature, care, and cleaning of the rifle.
2. Correct firing positions and use of the gun sling.
3. Sight setting.
4. The loadings and firings, safety precautions, and kinds of fire.
5. Arm and whistle signals.
6. Military hygiene, first aid, and camp sanitation.
7. Scouting and patrolling.
8. Advance and rear guards, and outposts.
9. Use of cover.
10. Adjustment of equipment, arrangement of clothing, rations, and toilet articles in the pack; demonstration in making up the pack.
11. Officers' and petty officers' school in the Landing-Force Manual.
12. Instruction of company signalmen and of the pioneers and ambulance parties in their duties.

13. Nomenclature, care, and cleaning of the pistol.

14. Nomenclature, care, and cleaning of the machine gun.

15. Use of the machine gun, kinds of fire, causes and correction of interruptions in their fire.

16. Intrenchments, their construction and use; preparation of buildings for defense; barricades, etc.

17. Messages and reports.

In addition to the above the **artillery companies** should be given the following instruction on board ship:

18. Nomenclature, care, and cleaning of the gun and gun sights.

19. The training of the crew, and of a spare crew, in their duties at the piece.

20. The use and nomenclature of all range finding, and firing data determining, instruments.

21. Nomenclature and setting of fuses.

22. The kinds of fire that may be employed.

23. Methods and objects of fire.

24. Preparation of firing data.

97. The landing force should be thrown ashore for drill as often as practicable. No amount of instruction on board ship can compensate for lack of shore drills and practical work.

Close-order drill is employed to obtain that teamwork, ready and implicit obedience to command, and fire discipline, that can not be gained by any other means.

98. When proper smartness and precision in close-order drills has been gained, all fighting formations, extended order, advance and rear guard work, and patrolling, can be more easily taught, and should always constitute most of the drill period. However, the drill should always end with a short well-conducted close-order drill.

99. Practice marches should be included, from time to time, as circumstances permit. It is important to have good march discipline, and it can not be taught without marching. During such marches instruction in security, patrolling, deployment for action, passage of defiles, and halts for the night, including the disposition of outposts, are included in the exercises.

100. The best results at drill and in actual service in the field are obtained by those officers who take the greatest interest in the welfare and comfort of their men, who share their hardships cheerfully, and who are themselves, examples of what their men should be. *A company always reflects the character of its officers.*

Sec. VI.—MISCELLANEOUS DATA.

101. The following list of equipment forms a part of the standard issue to Marine Corps organizations. It is useful as a guide for assembling similar equipment, when available, for the landing force:

I. Reconnaissance outfit for each battalion and regiment.

1. Equipment.

1 alidade.
2 boards, sketching.
1 chest, sketching outfit.
1 clinometer, service, with case.
1 holder, timing pad.
1 pace tally.
1 pencil, pocket.
1 tripod, wood, folding.

2. Supplies.

12 celluloid, sheets.
2 erasers, rubber.
6 pads, timing.
72 paper, sketching board, sheets.
2 pencils, blue.
6 pencils, drawing, H.
2 pencils, green.
2 pencils, red.
2 protectors, pencil point.
2 tape, adhesive, rolls.

II. Battery commander's fire control equipment (artillery only).

1 sextant telemeter and case, or
1 range finder.
2 steel tapes, 100 feet.
2 battery commander's rules with cases.
1 battery commander's telescope and case.
1 tripod for battery commander's telescope and case.
2 time interval recorders.
2 time interval recorder chains.
1 battery case.
1 field glass, type C, in case.
3 telephones, in cases.
2 hand reels.
2 spools, double buzzer wire.
3 inspector's pocket kits.
2 flag kits, 2 feet.
2 megaphones, Model 1911.
6 field glasses, Type B, in cases
4 buzzer connectors.
3 plugs for telephones.

III. Company equipment.

1. Spare parts kit for rifle.

2 bolts.
7 firing pins.
5 cut-offs.
5 ejectors.
5 ejector pins.
5 extractors.
10 front sights.
10 front sight pins.
10 front sight covers.
2 lower band screws.
2 rear sight joint pins.
3 rear sight slides, assembled.
5 rear sight slide binding screws.
4 rear sight slide cap pins.
5 rear sight slide cap screws.
2 rear sight windage screws, assembled.
2 safety locks, complete.
1 sear.
2 stacking swivels.
2 magazine springs.
2 main springs.
2 stacking swivel screws.
20 strikers.

III. Company equipment—Continued.

2. Repair kit for model 1903 rifle.

1 chest.
1 anvil and block.
1 bullet jacket extractor.
10 drifts (1 each of Nos. 1, 2, 3, 4, 5, 6, 7, and 9; and 2 of No. 8).
1 hammer, steel.
1 pair of pliers.
3 screw drivers (Nos. 1, 2, and 3).
1 set (No. 1).
1 assembling tool.
1 block, wood.[1]
1 hammer, brass.[1]
1 set (No. 2).[1]

3. Cleaning and spare parts kit for pistol.

2 plugs.
2 recoil springs.
1 cleaning box, with packing block.
10 cleaning rods.
10 thong brushes.
10 screw drivers.
1 oil can.
1 grease pot.

4. Intrenching tools provided for each squad.

1 hand ax, with carrier.
1 pick mattock, with carrier.
3 shovels, with carriers.
1 wire cutter, with carrier.
1 machete, with carrier.

5. Company tool box.

1 company tool box.
1 marking brush.
1 hatchet.
1 claw hammer.
3 sail needles.
1 padlock.
1 sail palm.
1 nail puller.
1 brass stencil, ½-inch.
1 ratchet brace.
3 augur and brace bits.
1 jack plane.
1 tape measure, 75 feet.
1 cross-cut saw.
1 rip saw.
1 screw driver.
1 steel square.
½ pound of beeswax.
5 yards tent canvas, 8-oz.
200 feet clothesline.
15 pounds wire nails, 8-penny.
1 gross wood screws.
3 pounds galvanized iron wire (100 feet).
1 pound sail twine.

6. Company police chest.

1 company police chest.
1 padlock.
2 axes.
2 pickaxes.
2 pavement scrub and stable brooms, with handles.
2 ax handles.
2 pickax handles.
6 machetes.
6 mallets, L. H.
2 iron rakes.
4 shovels, short handle, square point.
4 spades.

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[1] The last three items are for regulating the socket spring of the cartridge belt, Model 1903.

III. *Company equipment*—Continued.

7. *Officers' mess chest (per company).*

1 chest.
1 corkscrew.
1 padlock.
1 vinegar bottle.
1 soup bowl, enamel.
1 sugar bowl, enamel.
1 pepper box.
6 table knives.
1 can opener.
1 water pitcher, enamel, 1 pint.
6 dinner plates, enamel.
1 meat plate, enamel.
6 soup plates, enamel.
1 coffeepot.
6 cups, enamel.
1 butter dish, enamel.
2 vegetable dishes, enamel.
1 carving fork.
6 table forks.
1 carving knife.
1 salt cellar.
6 saucers, enamel.
4 table-spoons.
8 teaspoons.
8 tumblers.

8. *Field range (Donavin) complete.*

1 range.
4 boilers with lids, nested.
1 cleaver.
1 pot chain.
1 meat chopper.
1 dipper.
3 dredgers.
1 carving fork.
1 meat fork.
1 griddle, iron.
1 tent guard.
1 bread knife.
1 butcher knife.
1 carving knife.
1 ladle, solid.
1 ladle, pierced.
1 frying pan.
2 roasting pans.
5 joints of stovepipe
1 elbow.
1 can opener.
1 meat saw.
1 shovel.
1 sieve.
1 skimmer.
1 basting spoon.
1 butcher steel.
1 cake turner.

IV. *Dimensions and weights (miscellaneous).*

	Pounds.
1 box of ammunition (1,200 rounds) cal. 30 rifle	95
1 box of ammunition (2,000 rounds) cal. 45 pistol	110
1,000 rations weigh about	3,800
Field range with utensils	410
Hospital tent (complete)	225
Wall tent (complete)	99
Shelter tent (complete), 2 poles, 10 pins	8½

Dimensions of tents:
Hospital tent (pitched) 14 feet long by 14 feet 6 inches wide.
Wall tent (pitched) 9 feet long by 8 feet wide.
Each shelter tent half is 65 by 61 inches.

CHAPTER II.

INTERIOR GUARD DUTY AND SECURITY AND INFORMATION.

INTRODUCTION.

102. Guards may be divided into three classes: Interior guards, exterior guards, and provost guards.

103. Interior guards are used in camp or garrison to preserve order, protect property, and to enforce police regulations. In time of war such sentinels of an interior guard as may be necessary are placed close in or about a camp, and normally there is an exterior guard farther out consisting of outposts. In time of peace the interior guard is the only guard in a camp or garrison.

104. Exterior guards are used to prevent surprise, to delay attack, and otherwise to provide for the security of the main body. (Art. 301 et seq.)

On the march they take the form of advance guards, rear guards, and flank guards. At a halt they consist of outposts.

105. Provost guards are used in conjunction with the civil or military police, to preserve order in territory adjacent to a camp or marching column, to enforce police regulations, suppress disorder, prevent straggling, etc. (See Art. 456 et seq.)

Sec. I.—INTERIOR GUARD DUTY.

Classification.

106. The various elements of an interior guard classified according to their particular purposes and the manner in which they perform their duties are as follows:

(a) The main guard.

(b) Special guards: Prisoner guards, train guards, boat guards, watchmen, etc.

Details and Rosters.

107. The interior guard will consist of such number of officers and enlisted men as the commanding officer may deem necessary, and will be commanded by the senior officer or petty officer therewith, under the supervision of the officer of the day or other officer detailed by the commanding officer.

In order that guard duty may not be needlessly irksome and interfere with tactical instruction, the number of men detailed for guard will be the smallest possible. Commanding officers are specifically charged with this matter.

108. At posts where there are less than three companies the main guard and special guards may all be furnished by one company or by detail from each company.

Where there are three or more companies, the main guard will, if practicable, be furnished by a single company, and, as far as practicable, the same organization will supply all details for that day for special guard, overseer, and fatigue duty. In this case the officer of the day, and the officers of the guard, if there are any, will, if practicable, be from the company furnishing the guard.

109. At a post or camp where the headquarters of more than one regiment are stationed, or in the case of a small brigade in the field, if but one guard be necessary for the whole command, the details will be made from the headquarters of the command.

If formal guard mounting is to be held, the adjutant, bn. c. p. o., and band to attend guard mounting will be designated by the commanding officer. (See Art. 2220 et seq.)

110. When a single organization furnishes the guard, a roster of organizations will be kept under the supervision of the adjutant.

When the guard is detailed from several organizations, a roster will be kept by the adjutant, of officers of the day and officers of the guard by name; under the supervision of the adjutant, a roster of p. os., musicians and men of the guard by number per organization; and by company c. p. os., a roster of p. os., musicians and men by name.

C. cs. will supervise the keeping of company rosters and see that all duties performed are duly credited.

111. There will be an officer of the day with each guard, unless in the opinion of the commanding officer the guard is so small that his services are not needed. In this case an officer will be detailed to supervise the command and instruction of the guard for such period as the commanding officer may direct.

112. When more than one guard is required for a command, a field officer of the day will be detailed, who will receive his orders from the brigade commander. When necessary, officers not lower in rank than lieutenant (captain M. C.) may be placed on the roster for field officer of the day.

113. The detail of officers of the guard will be limited to the necessities of the service and efficient instruction; inexperienced officers may be detailed as supernumerary officers of the guard for purposes of instruction.

114. Officers serving in staff departments are, in the discretion of the commanding officer, exempt from guard duty.

115. Guard details will, if practicable, be posted or published the day preceding the beginning of the tour, and officers notified personally by a written order at the same time.

116. The members of main guards will habitually be relieved every 24 hours. The length of the tour of enlisted men detailed as special guards will be so regulated as to permit of these men being held accountable for a strict performance of their duty.

117. Should the officer of the day be notified that men are required to fill vacancies in the guard, he will cause them to be supplied from the organization to which the guard belongs. If none are available in that organization, the adjutant will be notified and will cause them to be supplied from the organization that is next for guard. See Art. 152.

118. The adjutant will have posted on the bulletin board at his office all data needed by company commanders in making details from their companies.

At chief petty officer's call, c. p. os. will go to headquarters and take from the bulletin board all data necessary for making the details required from their companies; these details will be made from their company rosters.

119. In order to give ample notice, c. p. os. will, when practicable, publish at retreat and post on the company bulletin board all details made from the company for duties to be performed.

Where rosters are required to be kept by these regulations, all details will be made by roster.

The Commanding Officer.

120. The commanding officer will exact a faithful, vigilant, and correct performance of guard duty in all of its details, giving his orders to the officer of the day, or causing them to be communicated

to him with the least practicable delay. He will prescribe the strength of the guard and the necessary regulations for guard, police, and fatigue duty.

121. The commanding officer receives the reports of the officers of the day immediately after guard mounting, at his office, or at some other place previously designated; carefully examines the guard report and remarks thereon (questioning the old officer of the day, if necessary, concerning his tour of duty), relieves the old officer of the day, and gives the new officer of the day such instructions as may be necessary.

The Officer of the Day.

122. The officer of the day is responsible for the proper performance of duty by the guard with which he marches on and for the enforcement of all police regulations. He is charged with the execution of all orders of the commanding officer relating to the safety and good order of the post or camp. His actual tour begins when he receives the instructions of the commanding officer after guard mounting and ceases when he has been relieved by the commanding officer. In case of emergency during the interval between guard mounting and reporting to the commanding officer, the senior officer of the day will give the necessary instructions for both guards.

123. In the absence of special instructions from the commanding officer, the officer of the day will inspect the guard and sentinels during the day and at night at such times as he may deem necessary. He will visit them at least once between 12 o'clock midnight and daylight.

124. He may prescribe patrols (Art. 269) and visits of inspection to be made by officers and p. os. of the guard whenever he deems it necessary.

He will see that the commander of the guard is furnished with the parole and countersign before retreat, in case they are to be used.

In case of alarm of any kind he will at once take such steps as may be necessary to insure the safety of life and public property and to preserve order in the command, disposing his guard so as best to accomplish this result.

125. In the performance of his duties as officer of the day he is subject to the orders of the commanding officer only, except that in case of an alarm of any kind, and at a time of great danger, the senior line officer present is competent to give necessary orders to the officer of the day for the employment of the guard.

126. At the inspections and musters the officer of the day will be present at the post of the guard, but all commands to the guard will be given by the commander of the guard.

127. Both officers of the day together verify the prisoners and inspect the guardhouse and premises.

In the absence of orders to the contrary the old officer of the day will, at guard mounting, release all prisoners, except G. C. M. prisoners, whose sentences expire that day. If there are any prisoners with no record of charges against them, the old officer of the day will report that fact to the commanding officer, who will give the necessary instructions.

128. The old officer of the day signs the report of the commander of the guard. He also enters on it such remarks as may be necessary. (Art. 156.)

129. The officers of the day then report to the commanding officer. On presenting themselves, both salute with the right hand, remaining covered. The old officer of the day, standing on the right of the new, then says: "**Sir, I report as old officer of the day,**" and presents the guard report. As soon as the commanding officer notifies the old officer of the day that he is relieved, the old officer of the day salutes the commanding officer and retires. The new officer of the day again salutes and says: "**Sir, I report as new officer of the day,**" and then receives his instructions.

130. The officer of the day will always keep the guard informed as to where he may be found at all hours of the day and night.

Commander of the Guard.

131. The commander of the guard is responsible for the instruction and discipline of the guard. He will see that all of its members are correctly instructed in their orders and duties, and that they understand and properly perform them. He will visit each relief at least once while it is on post, and at least one of these visits will be made between 12 o'clock midnight and daylight.

132. He receives and obeys the orders of the commanding officer and the officer of the day, and reports to the latter without delay all orders to the guard not received from the officer of the day; he transmits to his successor all material instructions and information relating to his duties.

133. He is responsible under the officer of the day for the general safety of the post or camp as soon as the old guard marches away

from the guardhouse. In case of emergency while both guards are at the guardhouse, the senior commander of the two guards will be responsible that the proper action is taken.

134. Officers of the guard will remain constantly with their guards, except while visiting sentinels or necessarily engaged elsewhere in the performance of their duties. The commanding officer will allow a reasonable time for meals.

A commander of a guard leaving his post for any purpose will inform the next in command of his destination and probable time of return.

135. Except in emergencies, the commander of the guard may divide the night with the next in command, but retains his responsibility; the one on watch must be constantly on the alert.

136. When any alarm is raised in camp or garrison, the guard will be formed immediately. If the case be serious, the proper call will be sounded, and the commander of the guard will at once cause the commanding officer and the officer of the day to be notified.

137. If a sentinel calls: "**The guard,**" the commander of the guard will at once send a patrol to the sentinel's post. If the danger be great, in which case the sentinel will discharge his piece, the patrol will be as strong as possible. (See Art. 233.)

138. When practicable, there should always be an officer or p. o. and two men of the guard at the guardhouse, in addition to the sentinels there on post.

139. Between 8 a. m. and retreat, when the guard has been turned out for any person entitled to the compliment (see Arts. 271 and 272), the commander of the guard, if an officer, will receive the report of the 1 p. o., returning the salute of the latter with the right hand. He will then draw his sword, and place himself 3 paces in front of the center of the guard. When the person for whom the guard has been turned out approaches, he faces his guard and commands: 1. **Present,** 2. **ARMS**; faces to the front and salutes. When his salute is acknowledged he resumes the carry, faces about and commands: 1. **Order,** 2. **ARMS**; and faces to the front.

When the guard is turned out for the commanding officer or officer of the day, the commander of the guard, after saluting and before bringing his guard to an order reports: "**Sir, all present or accounted for**"; or, "**Sir, (so and so) is absent**"; or, if the roll has been omitted: "**Sir, the guard is formed,**" except that at guard mounting the commanders of the guards present their guards and salute without making any report.

Between retreat and 8 a. m., the commander of the guard salutes and reports, but does not bring the guard to a present.

140. To those entitled to have the guard turned out, but not entitled to inspect it, no report will be made; nor will a report be made to any officer, unless he halts in front of the guard.

141. When a guard commanded by a p. o. is turned out as a compliment or for inspection, the p. o., standing at a right shoulder on the right of the right guide, commands: 1. **Present**, 2. **ARMS**. He then executes the rifle salute. If a report be also required, he will, after saluting, and before bringing his guard to an order, report as prescribed for the officer of the guard. (Art. 139.)

142. When a guard is in line, not under inspection, and commanded by an officer, the commander of the guard salutes his regimental, battalion, and company commander, by bringing the guard to attention and saluting in person.

For all other officers, excepting those entitled to the compliment from a guard (see Art. 272), the commander of the guard salutes in person, but does not bring the guard to attention.

When commanded by a p. o. the guard is brought to attention in either case, and the p. o. salutes.

The commander of a guard exchanges salutes with the commanders of all other bodies of troops; the guard is brought to attention during the exchange.

"**Present arms**" is executed by a guard only when it has turned out for inspection or as a compliment, and at the ceremony of guard mounting.

143. In marching a guard or a detachment of a guard the principles of Art. 142 apply. "**Eyes right**" is executed only in the ceremonies of guard mounting and relieving the old guard.

144. If a person entitled to the compliment, or the regimental, battalion, or company commander passes in rear of a guard, neither the compliment nor the salute is given, but the guard is brought to attention while such person is opposite the post of the commander.

After any person has received or declined the compliment, or received the salute from the commander of the guard, official recognition of his presence thereafter while he remains in the vicinity will be taken by bringing the guard to attention.

145. The commander of the guard will inspect the guard at reveille and retreat, and at such other times as may be necessary to assure himself that the men are in proper condition to perform their duties and that their arms and equipments are in proper condition. For inspection by other officers, he prepares the guard in each case as directed by the inspecting officer.

146. The guard will not be paraded during ceremonies unless directed by the commanding officer.

147. At all formations members of the guard or reliefs will execute inspection arms as prescribed in the drill regulations. (See Art. 1521.)

148. The commander of the guard will see that all sentinels are habitually relieved every two hours, unless the weather or other cause makes it necessary that it be done at shorter or longer intervals, as directed by the commanding officer.

149. He will question his p. os. and sentinels relative to the instructions they may have received from the old guard; he will see that patrols and visits of inspection are made as directed by the officer of the day.

150. He will see that the special orders for each post and member of the guard, either written or printed, are posted in the guardhouse, and, if practicable, in the sentry box or other sheltered place to which the member of the guard has constant access.

151. He will see that the proper calls are sounded at the hours appointed by the commanding officer.

152. Should a member of the guard be taken sick, or be arrested, or desert, or leave his guard, the commander of the guard will at once notify the officer of the day. (See Art. 117.)

153. He will, when the countersign is used (Arts. 262 et seq.), communicate it to the p. os. of the guard and see that it is duly communicated to the sentinels before the hour for challenging; the countersign will not be given to sentinels posted at the guardhouse.

154. He will have the details for hoisting the flag at 8 a. m. and lowering it at retreat made in time for the proper performance of these duties. (See Art. 297 et seq.) He will see that the flags are kept in the best condition possible.

155. He may permit members of the guard while at the guardhouse to remove their headdress, overcoats, and gloves; if they leave the guardhouse for any purpose whatever he will require that they be properly equipped and armed according to the character of the service in which engaged, or as directed by the commanding officer.

156. He will enter in the guard report a report of his tour of duty, and, on the completion of this tour, will present it to the officer of the day. The report will contain an accurate list of all prisoners whose term of confinement has not expired, and under a separate heading a list of all prisoners who have been released during his tour, with authority for such release.

In all cases the prison report will show the name and rating of each prisoner, his offense, punishment, date of confinement, and by whom confined. (See Art. 282.)

He will transmit with this report all passes turned in at the post of the guard.

157. Whenever a prisoner is sent to the guardhouse or guard tent for confinement, he will cause him to be searched, and will, without unnecessary delay, report the case to the officer of the day.

158. Under war conditions, any one who is to be passed out of camp at night, will be sent to the commander of the guard, who will have him passed beyond the sentinels.

159. The commander of the guard will detain at the guardhouse all suspicious characters or parties attempting to pass a sentinel's post without authority, reporting his action to the officer of the day, to whom persons so arrested will be sent, if necessary.

160. He will inspect the guardrooms and cells, and the irons of such prisoners as may ironed, at least once during his tour, and at such other times as he may deem necessary.

161. He will cause the p. os. of the old and new reliefs to verify together, immediately before each relief goes on post, the number of prisoners who should then properly be at the guardhouse.

162. He will see that the sentences of prisoners under his charge are executed strictly in accordance with the action of the reviewing authority.

163. He will, as far as practicable, assign as guards over working parties of prisoners sentinels from posts guarded at night only.

164. The commander of the guard will inspect all meals sent to the guardhouse and see that the quantity and quality of food are in accordance with regulations.

165. At guard mounting he will report to the old officer of the day all cases of prisoners whose terms of sentence expire on that day, and also all cases of prisoners concerning whom no statement of charges has been received.

166. The commander of the guard is responsible for the security of the prisoners under the charge of his guard; he becomes responsible for them after their number has been verified and they have been turned over to the custody of his guard by the old guard or by the prisoner guard or overseers.

The prisoners will be verified and turned over to the new guard without parading them, unless the commanding officer or the officer of the day shall direct otherwise. Prisoners, when paraded with the guard, are formed in line in its center.

To receive the prisoners when they have been paraded and after they have been verified by the officers of the day, the commander of the new guard directs his 1 p. o. to form his guard with an interval, and marches and forms the prisoners in the interval in the new guard.

1 P. O. of the Guard.

167. The senior p. o. of the guard always acts as 1 p. o. of the guard, and if there be no officer of the guard, will perform the duties prescribed for the commander of the guard.

168. The 1 p. o. of the guard has general supervision over the other p. os. and the musicians and men of the guard, and must be thoroughly familiar with all of their orders and duties.

169. He is directly responsible for the property under charge of the guard, and will see that it is properly cared for. He will make lists of articles taken out by working parties, and see that all such articles are duly returned. If they are not, he will immediately report the fact to the commander of the guard.

170. Immediately after guard mounting he will prepare duplicate lists of the names of all p. os., musicians, and men of the guard, showing the relief and post or duties of each. One list will be handed as soon as possible to the commander of the guard; the other will be retained by the 1 p. o.

171. He will see that all reliefs are turned out at the proper time, and that the 2 p. os. thoroughly understand, and are prompt and efficient in, the discharge of their duties.

172. During the temporary absence from the guardhouse of the 1 p. o. of the guard, the next in rank of the p. os. will perform his duties.

173. Should the p. o. whose relief is on post be called away from the guardhouse, the 1 p. o. of the guard will designate a p. o. to take his place until his return.

174. The 1 p. o. of the guard is responsible at all times for the proper police of the guardhouse or guard tent, including the ground about them and the prison cells.

175. At "**chief petty officer's call**" he will proceed to the adjutant's office and obtain the guard report book.

176. When the national, regimental or battalion colors are taken from the stacks of the color line, the color bearer and guard, or 1 p. o. of the guard, unarmed, and two armed men as a guard, will escort the colors to the commanding officer's quarters, as prescribed for the color guard in the drill regulations.

177. He will report to the commander of the guard any suspicious or unusual occurrence that comes under his notice, will warn him of the approach of any armed body, and will send to him all persons arrested by the guard.

178. When the guard is turned out, its formation will be as follows: The senior p. o., if commander of the guard, is on the right of the right guide; if not commander of the guard, he is in the line of file closers, in rear of the right squad of the guard; the next in rank is right guide; the next, left guide; the others in the line of file closers, each in rear of his relief; the field music, with its left 3 paces to the right of the right guide. The reliefs form in the same order as when the guard was first divided.

179. The 1 p. o. forms the guard, calls the roll, and, if not in command of the guard, reports to the commander of the guard as prescribed in drill regulations for a c. p. o. forming a company; the guard is not divided into platoons and, except when the whole guard is formed prior to marching off, does not count off. (See Art. 2237.)

180. The 1 p. o. reports as follows: "**Sir, all present or accounted for**," or "**Sir, (so and so) is absent**"; or if the roll call has been omitted, "**Sir, the guard is formed.**" Only men absent without proper authority are reported absent. He then takes his post without command.

At night the roll may be called by reliefs and numbers instead of names; thus, the first relief being on post: **Second relief, 2 p. o.**; **No. 1**; **No. 2**, etc.; **Third relief, 2 p. o.**; **No. 1**, etc.

Calling the roll will be dispensed with in forming the guard when it is turned out as a compliment, on the approach of an armed body, or in any sudden emergency; but in such cases the roll may be called before dismissing the guard. If the guard be turned out for an officer entitled to inspect it, the roll will, unless he directs otherwise, always be called before a report is made.

181. The 1 p. o. of the guard has direct charge of the prisoners, except during such time as they may be under the charge of the prisoner guard or overseers, and is responsible to the commander of the guard for their security.

182. He will carry the keys of the guardroom and cells and will not suffer them to leave his personal possession while he is at the guardhouse. Should he leave the guardhouse for any purpose, he will turn the keys over to the p. o. who takes his place. (Art. 172.)

183. He will count the knives, forks, etc., given to the prisoners with their food and see that none of these articles remain in their possession. He will see that no forbidden articles of any kind are conveyed to the prisoners.

184. If sentinels are numerous, reliefs may, at the discretion of the commanding officer, be posted in detachments, and 1 p. os. as well as 2 p. os. required to relieve and post them.

2 P. O. of the Guard.

185. A 2 p. o. of the guard receives and obeys orders from none but p. os. of the guard senior to himself, the officers of the guard, the officer of the day, and the commanding officer.

186. It is the duty of the p. o. of the guard to post and relieve sentinels and to instruct the members of his relief in their orders and duties.

187. Immediately after the division of the guard into reliefs the 2 p. os. will assign the members of their respective reliefs to posts by number, and a man so assigned to his post will not be changed to another during the same tour of guard duty, unless by direction of the commander of the guard or higher authority. Usually experienced men are placed over the arms of the guard and at remote and responsible posts.

Each 2 p. o. will then make a list of the members of his relief, including himself. This list will contain the number of the relief, the name, the company, and the regiment of every member thereof, and the post to which each is assigned. The list will be made in duplicate, one copy to be given to the 1 p. o. of the guard as soon as completed, the other to be retained by the 2 p. o.

188. When directed by the commander of the guard, the 2 p. o. of the first relief forms his relief and then commands: **CALL OFF.**

Commencing on the right, the men call off alternately *rear* and *front* rank, "one," "two," "three," "four," and so on; if in single rank, they call off from right to left. The 2 p. o. then commands:

1. **Right**, 2. **FACE**, 3. **Forward**, 4. **MARCH**.

The 2 p. o. marches on the left, and near the rear file, in order to observe the march. The 2 p. o. of the old guard marches on the right of the leading file and takes command when the last one of the old sentinels is relieved, changing places with the 2 p. o. of the new guard

When the relief arrives at 6 paces from the sentinel (Art. 1125) the 2 p. o. halts it and commands, according to the number of the post: **No.** (—).

Both sentinels execute port arms; the new sentinel approaches the old, halting about 1 pace from him. (Art. 1129.)

The 2 p. os. advance and place themselves, facing each other, a little in advance of the new sentinel, the old 2 p. o. on his right, the new 2 p. o. on his left, both at a right shoulder, and observe that the old sentinel transmits correctly his instructions.

The following diagram will illustrate the positions taken:

The instructions relative to the post having been communicated, the new p. o. commands. **POST**; both sentinels then resume the right shoulder, face toward the new 2 p. o. and step back so as to allow the relief to pass in front of them. The new 2 p. o. then commands: 1. **Forward**, 2. **MARCH**; the old sentinel takes his place in rear of the relief as it passes him, his piece in the same position as those of the relief. The new sentinel stands fast at a right shoulder until the relief has passed 6 paces beyond him, when he walks his post. The 2 p. os. take their places as the relief passes them.

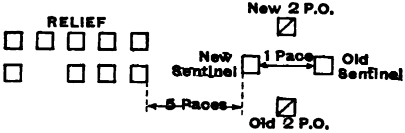

FIG. 2.—Posting a sentinel.

Mounted sentinels are posted and relieved in accordance with the same principles.

On the return of the old relief, the 2 p. o. of the new guard falls out when the relief halts; the 2 p. o. of the old guard forms his relief on the left of the old guard, salutes, and reports to the commander of his guard: "**Sir, the relief is present;**" or "**Sir (so and so), is absent,**" and takes his place in the guard.

189. To post a relief other than that which is posted when the old guard is relieved, its p. o. commands: 1. **(Such) relief**, 2. **FALL IN**; and if arms are stacked, they are taken at the proper commands.

The relief is formed facing to the front, with arms at an order; the men place themselves according to the numbers of their respective posts, viz. **two, four, six**, and so on, in the **front rank**, and **one, three, five**, and so on, in the **rear rank**. The 2 p. o., standing about 2 paces in front of the center of his relief, then commands: **CALL OFF.**

The men call off as prescribed. The 2 p. o. then commands: 1. **Inspection**, 2. **ARMS**, 3. **Order**, 4. **ARMS**; faces the commander of the guard, executes the rifle salute, reports: "**Sir, the relief is**

present," or "**Sir, (so and so) is absent**"; he then takes his place on the right at order arms.

When the commander of the guard directs the 2 p. o.: "**Post your relief,**" the p. o. salutes and posts his relief as prescribed (Art. 188), the p. o. of the relief on post does not go with the new relief, except when necessary to show the way.

To dismiss the old relief, it is halted and faced to the front at the guardhouse by the p. o. of the new relief, who then falls out; the p. o. of the old relief then steps in front of the relief and dismisses it by the proper commands.

190. Should the pieces have been loaded before the relief was posted, the p. o. will, before dismissing the relief, see that no cartridges are left in the chambers or magazines. The same rule applies to sentinels over prisoners.

191. Each 2 p. o. will thoroughly acquaint himself with all the special orders of every sentinel on his relief, and see that each understands and correctly transmits such orders in detail to his successor.

192. There should be at least one p. o. constantly on the alert at the guardhouse, usually the p. o. whose relief is on post. This p. o. takes post near the entrance of the guardhouse, and does not fall in with the guard when it is formed. He will have his rifle constantly with him.

Whenever it becomes necessary for the 2 p. o. to leave his post near the entrance of the guardhouse, he will notify the 1 p. o. of the guard, who will at once take his place, or designate another p. o. to do so.

193. He will see that no person enters the guardhouse, or guard tent, or crosses the posts of the sentinels there posted without proper authority.

194. Should any sentinel call for the p. o. of the guard, the 2 p. o. will, in every case, at once and quickly proceed to such sentinel. He will notify the 1 p. o. of the guard before leaving the guardhouse.

195. He will at once report to the commander of the guard any violation of regulations or any unusual occurrence which is reported to him by a sentinel, or which comes to his notice in any other way.

196. Should a sentinel call: "**The Guard,**" the 2 p. o. will promptly notify the commander of the guard.

Should a sentinel call: "**Relief,**" the 2 p. o. will at once proceed to the post of such sentinel, taking with him the man next for duty on that post. If the sentinel is relieved for a short time only, the

2 p. o. will again post him as soon as the necessity for his relief ceases.

197. When the countersign is used, the 2 p. o. at the posting of the relief during whose tour challenging is to begin gives the countersign to the members of the relief, excepting those posted at the guardhouse.

198. He will wake the p. o. whose relief is next on post in time for the latter to verify the prisoners, form his relief, and post it at the proper hour.

199. Should the guard be turned out, each 2 p. o. will call his own relief, and cause its members to fall in promptly.

Tents or bunks in the same vicinity will be designated for the reliefs so that all the members of each relief may, if necessary, be found and turned out by the 2 p. o. in the least time and with the least confusion.

200. When challenged by a sentinel while posting his relief, the p. o. commands: 1. **Relief,** 2. **HALT**; to the sentinel's challenge he answers, "**Relief,**" and at the order of the sentinel he advances alone to give the countersign, or to be recognized. When the sentinel says, "**Advance relief,**" the p. o. commands: 1. **Forward,** 2. **MARCH**.

If to be relieved, the sentinel is then relieved as prescribed.

201. Between retreat and reveille, the p. o. of the guard will challenge all suspicious looking persons or parties he may observe, first halting his patrol or relief, if either be with him. He will advance them in the same manner that sentinels on post advance like parties (Arts. 246 to 252), but if the route of a patrol is on a continuous chain of sentinels, he should not challenge persons coming near him unless he has reason to believe that they have eluded the vigilance of sentinels.

202. Between retreat and 8 a. m., whenever so ordered by an officer entitled to inspect the guard, the 2 p. o. will call: "**Turn out the guard,**" announcing the title of the officer, and then, if not otherwise ordered he will salute and return to his post.

203. As a general rule he will advance parties approaching the guard at night in the same manner that sentinels on post advance like parties. Thus, the sentinel at the guardhouse challenges and repeats the answer to the 2 p. o., as prescribed hereafter (Art. 1153); the 2 p. o. advancing at "port arms," says: "**Advance (so and so) with the countersign,**" or "**to be recognized,**" if there be no countersign used; the countersign being correctly given, or the party

being duly recognized, the 2 p. o. says: "**Advance (so and so)**"; repeating the answer to the challenge of the sentinel.

When officers of different rank approach the guardhouse from different directions at the same time, the senior will be advanced first, and will not be made to wait for his junior.

204. Out of ranks and under arms, the 2 p. o. salutes with the rifle salute. He will salute all officers whether by day or night.

205. The 2 p. o. will examine parties halted and detained by sentinels, and if he has reason to believe the parties have no authority to cross sentinels' posts, will conduct them to the commander of the guard.

206. The 2 p. o. of the guard will arrest all suspicious looking characters prowling about the post or camp, all persons of a disorderly character disturbing the peace, and all persons taken in the act of committing crime against the government on a naval reservation or post. All persons arrested by p. os. of the guard, or by sentinels, will at once be conducted to the commander of the guard by the 2 p. o.

Musicians of the Guard.

207. The musicians of the guard will sound calls as prescribed by the commanding officer.

Should the guard be turned out for national, regimental, or battalion colors, uncased, the field music of the guard will, when the guard presents arms, sound, "**To the color**"; or, if for any person entitled thereto, the march, flourishes, or ruffles, prescribed in Navy Regulations.

Orderlies and Color Sentinels.

208. When so directed by the commanding officer, the officer who inspects the guard at guard mounting will select from the members of the new guard an orderly for the commanding officer and such number of other orderlies and color sentinels as may be required.

For these positions the men will be chosen who are most correct in the performance of duty and in military bearing, neatest in person and clothing, and whose arms and accouterments are in the best condition. Clothing, arms, and equipments must conform to regulations. If there is any doubt as to the relative qualifications of two or more men, the inspecting officer will cause them to fall out at the guardhouse and to form in line in single rank. He will then, by testing them in drill regulations, select the most proficient. The commander of the guard will be notified of the selection.

209. When directed by the commander of the guard to fall out and report, an orderly will give his name, company, and regiment to the 1 p. o. of the guard, and, leaving his rifle in the arm rack in his company quarters, will proceed at once to the officer to whom he is assigned, reporting: " **Sir, Seaman (Seaman 2d class, Private,** etc.) ———, — **Company, reports as orderly.**"

Orderlies, while on duty as such, are subject only to the orders of the commanding officer and of the officers to whom they are ordered to report.

When an orderly is ordered to carry a message, he will be careful to deliver it exactly as it was given to him.

His tour of duty ends when he is relieved by the orderly selected from the guard relieving his own.

Orderlies are members of the guard, and their name, company, and regiment are entered on the guard report and lists of the guard.

210. If a color line is established, sufficient sentinels are placed on the color line to guard the colors and stacks.

Color sentinels are posted only so long as the stacks are formed. The commander of the guard will divide the time equally among them.

211. When stacks are broken, the color sentinels may be permitted to return to their respective companies. They are required to report in person to the commander of the guard at reveille and retreat. They will fall in with the guard, under arms, at guard mounting.

Color sentinels are not placed on the regular reliefs, nor are their posts numbered. In calling for the 2 p. o. of the guard, they call: " **Petty officer of the guard. Color line.**"

212. Officers or enlisted men passing the uncased colors will render the prescribed salute. If the colors are on the stacks, the salute will be made on crossing the color line or on passing the colors.

213. A sentinel placed over the colors will not permit them to be moved, except in the presence of an armed escort. Unless otherwise ordered by the commanding officer, he will allow no one to touch them but the color bearer.

He will not permit any man to take arms from the stacks, or to touch them, except by order of an officer or p. o. of the guard.

If any person passing the colors or crossing the color line fails to salute the colors, the sentinel will caution him to do so, and if the caution be not heeded he will call the 2 p. o. of the guard and report the facts.

Men of the Guard.

214. Men are assigned to reliefs by the commander of the guard, and to posts, usually, by the p. o. of their relief. They will not change from one relief or post to another during the same tour of guard duty unless by proper authority.

Orders for Sentinels.

215. Orders for sentinels are of two classes: General orders and special orders. General orders apply to all sentinels. Special orders relate to particular posts and duties.

216. Sentinels will be required to memorize the following:

My general orders are:

1. **To take charge of this post and all Government property in view.**
2. **To walk my post in a military manner, keeping always on the alert and observing everything that takes place within sight or hearing.**
3. **To report all violations of orders I am instructed to enforce.**
4. **To repeat all calls from posts more distant from the guard-house than my own.**
5. **To quit my post only when properly relieved.**
6. **To receive, obey, and pass on to the sentinel who relieves me all orders from the commanding officer, officer of the day, and officers and petty officers of the guard only.**
7. **To talk to no one except in line of duty.**
8. **In case of fire or disorder to give the alarm.**
9. **To allow no one to commit a nuisance on or near my post.**
10. **In any case not covered by instructions to call the petty officer of the guard.**
11. **To salute all officers, and colors and standards not cased.**
12. **To be especially watchful at night, and, during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.**

Regulations Relating to the General Orders for Sentinels.

No. 1: **To take charge of this post and all Government property in view.**

217. All persons, of whatever rank in the service, are required to observe respect toward the sentinels and members of the guard when such are in the performance of their duties.

218. A sentinel will at once report to the 2 p. o. of the guard every unusual or suspicious occurrence noted.

He will arrest suspicious persons prowling about the post or camp at any time, all parties to a disorder occurring on or near his post, and all, except authorized persons, who attempt to enter the camp at night, and will turn over to the 2 p. o. of the guard all persons arrested.

219. The number, limits, and extent of his post will invariably constitute part of the special orders of a sentinel on post. The limits of his post should be so defined as to include every place to which he is required to go in the performance of his duties.

No. 2: **To walk my post in a military manner, keeping always on the alert and observing everything that takes place within sight or hearing.**

220. A sentinel is not required to halt and change the position of his rifle on arriving at the end of his post, nor to execute **to the rear, march,** precisely as prescribed in the drill regulations, but faces about while walking, in the manner most convenient to him, and at any part of his post as may be best suited to the proper performance of his duties. He carries his rifle on either shoulder, and in wet or severe weather, when not in a sentry box, may carry it in the best manner to protect it.

221. Sentinels when in sentry boxes stand at ease. Sentry boxes will be used in wet weather only, or at other times when specially authorized by the commanding officer.

222. In very hot weather, sentinels may be authorized to stand at ease on their posts, provided they can effectively discharge their duties in this position, but they will take advantage of this privilege only on the express authority of the officer of the day or the commander of the guard.

223. A mounted sentinel may dismount occasionally and lead his horse, but will not relax his vigilance.

No. 3: **To report all violations of orders I am instructed to enforce.**

224. A sentinel will ordinarily report a violation of orders when he is inspected or relieved, but if the case be urgent he will call the p. o. of the guard, and also, if necessary, will arrest the offender.

No. 4: **To repeat all calls from posts more distant from the guard house than my own.**

225. To call the p. o. of the guard, for any purpose other than relief, fire, or disorder (see Arts. 226 and 233), a sentinel will call, "**Petty officer of the guard, No.** (—)," adding the number of his post. In no case will any sentinel call "**Never mind the petty officer**"; nor will the 2 p. o. heed such call if given.

No. 5: **To quit my post only when properly relieved.**

226. If relief becomes necessary, by reason of sickness or other cause, a sentinel will call, "**Petty officer of the guard, No. (—), Relief,**" giving the number of his post.

227. Whenever a sentinel is to be relieved, he will halt, and with arms at a right shoulder, will face toward the relief when it is 30 paces from him. He will come to a port arms with the new sentinel, and in a low tone will transmit to him all the special orders relating to the post, and any other information which will assist him to better perform his duties.

No. 6: **To receive, obey, and pass on to the sentinel who relieves me, all orders from the commanding officer, officer of the day, and officers and petty officers of the guard only.**

228. During his tour of duty a member of the guard is subject to the orders of the commanding officer, officer of the day, and officers and p. os. of the guard only; but any officer is competent to investigate apparent violations of regulations by members of the guard.

229. A sentinel will quit his piece on an explicit order from any person from whom he lawfully receives orders while on post; under no circumstances will he yield it to any other person. Unless necessity therefor exists, no person will require a sentinel to quit his piece, even to allow it to be inspected.

230. A sentinel will not divulge the countersign (Arts. 262 to 268) to any one except the sentinel who relieves him, or to a person from whom he properly receives orders, on such person's verbal order given personally. Men of the guard will not use the countersign except in the performance of their duties while posted as sentinels.

No. 7: **To talk to no one except in line of duty.**

231. When calling for any purpose, challenging, or holding communication with any person, a sentinel, armed with a rifle, will take the position of "port" arms. At night a sentinel, armed with a pistol, takes the position of raise pistol in challenging or holding communication except when otherwise directed.

232. To execute *raise pistol*, the pistol is drawn from the holster and held in a position 6 inches in front of the point of the right shoulder, barrel to the rear and inclined forward about 30°; the right hand grasps the stock, with the thumb and last three fingers, forefinger extended *outside* the trigger guard.

No. 8: **In case of fire or disorder to give the alarm.**

233. In case of fire, a sentinel will call, "**Fire No. (—),**" adding the number of the post; if possible, he will extinguish the fire himself. In case of disorder, he will call: "**The Guard, No. (—),**" adding the number of his post. If the danger be great, he will, in either case, discharge his piece before calling. (See art. 326 (4).)

No. 11: **To salute all officers and colors and standards not cased.**

234. When not engaged in the performance of a specific duty, the proper execution of which would prevent it, a member of the guard will salute all officers, including warrant officers, who pass him. This rule applies at all hours of the day or night, except in the case of a sentinel armed with the pistol, after challenging. (Art. 238.)

235. Sentinels will salute as follows: A sentinel armed with a rifle, salutes by presenting arms; if otherwise armed, he salutes with the right hand.

236. To salute, a sentinel, with piece at a right shoulder, halts and faces toward the person to be saluted when the latter arrives within 30 paces.

The limit within which individuals and insignia of rank can be readily recognized is assumed to be about 30 paces, and therefore at this distance cognizance is taken of the person or party to be saluted.

The salute is rendered at 6 paces; if the person to be saluted does not arrive within that distance, then when he is nearest.

A sentinel in a sentry box, armed with a rifle, stands at attention in the doorway on the approach of a person or party entitled to salute and salutes by presenting arms according to the foregoing rules.

237. Sentinels salute, in accordance with the foregoing rules, all persons and parties entitled to compliments from the guard (See Arts. 272 to 274) officers of the Army, Navy, and Marine Corps; military and naval officers of foreign powers; officers of volunteers and of the National Army; and militia officers when in uniform.

238. A sentinel salutes as just prescribed when an officer comes on his post; if the officer holds communication with the sentinel, the sentinel again salutes when the officer leaves him.

During the hours when challenging is prescribed, the first salute is given as soon as the officer has been duly recognized and advanced. A sentinel armed with a pistol, if drawn, does not salute, but stands at raise pistol until the officer passes. (See art. 232.)

239. In case of the approach of an armed party of the guard, the sentinel will halt when it is about 30 paces from him, facing toward the party with his piece at the right shoulder. If not himself relieved, he will, as the party passes, place himself so that the party

will pass in front of him; he resumes walking his post when the party has reached 6 paces beyond him.

240. An officer is entitled to the compliments prescribed, whether in uniform or not.

241. A sentinel in communication with an officer will not interrupt the conversation to salute. In the case of seniors the officer will salute, whereupon the sentinel will salute.

242. When the flag is being hoisted or lowered, a sentinel on post and in view of the flag will face the flag, and, at the first note of the National Anthem or colors' call will come to present arms. At the sounding of the last note he will resume walking his post.

No. 12. **To be especially watchful at night, and during the time for challenging, to challenge all persons on or near my post, and to allow no one to pass without proper authority.**

243. During challenging hours, if a sentinel sees any person or party on or near his post, he will advance rapidly along his post toward such person or party, and when within about 30 yards will challenge sharply, "**HALT. Who is there?**" He will place himself in the best possible position to receive or, if necessary, to arrest the person or party. (See Art. 231.)

In case a mounted party be challenged, the sentinel will call, "**HALT. DISMOUNT. Who is there?**"

244. The sentinel will permit only one of any party to approach him for the purpose of giving the countersign (Arts. 262 to 268), or if no countersign be used, of being duly recognized. When this is done the whole party is advanced, i. e., allowed to pass.

245. In all cases the sentinel must satisfy himself beyond a reasonable doubt that the parties are what they represent themselves to be and have a right to pass. If he is not satisfied, he must cause them to stand and call the p. o. of the guard. So, likewise, if he has no authority to pass persons with the countersign, or when the party has not the countersign, or gives an incorrect one.

A sentinel will not permit any person to approach so close as to prevent the proper use of his own weapon before recognizing the person or receiving the countersign.

246. When two or more persons approach in one party, the sentinel on receiving an answer that indicates that some one of the party has the countersign, will say, "**Advance one with the countersign,**" and, if the countersign is given correctly, will then say, "**Advance** (**so-and-so**)," repeating the answer to his challenge. Thus, if the answer be "**Relief (friends with the countersign, patrol, etc),**" the sentinel will say, "**Advance one with the countersign**"; then, "**Advance relief (friends, patrol, etc.).**"

247. If a person having the countersign approach alone, he is advanced to give the countersign. Thus, if the answer be, "**Friend with the countersign** (or **officer of the day, or, etc.**)," the sentinel will say, "**Advance, friend** (or **officer of the day, or, etc.**) **with the countersign**"; then, "**Advance, friend** (or **officer of the day, or, etc.**)."

248. If two or more persons approach a sentinel's post from different directions at the same time, all such persons are challenged in turn and required to halt and to remain halted until advanced.

The senior is the first advanced, in accordance with the foregoing rules.

249. If a party is already advanced and in communication with a sentinel, the latter will challenge any other party that may approach; if the party challenged be senior to the one already on his post, the sentinel will advance the new party at once. The senior may allow him to advance any or all of the other parties; otherwise, the sentinel will not advance any of them until the senior leaves him. He will then advance the senior only of the remaining parties, and so on.

250. The following order of rank will govern a sentinel in advancing different persons or parties approaching his post: Commanding officer, officer of the day, officer of the guard, officers, patrols, reliefs, p. os. of the guard in order of rank, friends.

251. A sentinel will never allow himself to be surprised, nor permit two parties to advance upon him at the same time.

252. If no countersign be used, the rules for challenging are the same. The rules for advancing parties are modified only as follows: Instead of saying "**Advance (so-and-so) with the countersign,**" the sentinel will say, "**Advance (so-and-so) to be recognized.**" Upon recognition he will say, "**Advance (so-and-so).**"

253. Answers to a sentinel's challenge intended to confuse or mislead him are prohibited, but the use of such an answer as "**Friends with the countersign,**" is not to be understood as misleading, but as the usual answer made by officers, patrols, etc., when the purpose of their visit makes it desirable that their official capacity should not be announced.

Special Orders for Sentinels at the Post of the Guard.

254. Sentinels posted at the guard will be required to memorize the following:

Between 8 a. m. and retreat to turn out the guard for all persons designated by the commanding officer, for all colors or standards not cased, and in time of war for all armed parties approaching my post, except troops at drill and reliefs and detachments of the guard.

At night, after challenging any person or party, to advance no one but call the petty officer of the guard, repeating the answer to the challenge.

255. After receiving an answer to his challenge, the sentinel calls, "**Petty officer of the guard** (so and so)," repeating the answer to the challenge.

He does not in such cases repeat the number of his post.

He remains in the position assumed in challenging until the 2 p. o. has recognized or advanced the person or party challenged, when he resumes walking his post, or, if the person or party be entitled thereto, he salutes and, as soon as the salute has been acknowledged, resumes walking his post.

256. The sentinel at the post of the guard will be notified of the presence in camp or garrison of persons entitled to the compliment. (Art. 272.)

257. The following examples illustrate the manner in which the sentinel at the post of the guard will turn out the guard upon the approach of persons or parties entitled to the compliment (Arts. 272 to 274): "**Turn out the guard, Commanding Officer**"; "**Turn out the guard, Governor of a Territory**"; "**Turn out the guard, national colors**"; "**Turn out the guard, armed party**"; etc.

At the approach of the new guard at guard mounting the sentinel will call "**Turn our the guard, armed party.**"

258. Should the person named by the sentinel not desire the guard formed, he will salute, whereupon the sentinel will call "**Never mind the guard.**"

259. After having called "**Turn out the guard,**" the sentinel will never call "**Never mind the guard,**" on the approach of an armed party.

260. Though the guard be already formed he will not fail to call "**Turn out the guard,**" as required in his special orders, except that the guard will not be turned out for any person while his senior is at or coming to the post of the guard.

261. The sentinels at the post of the guard will warn the commander of the approach of any armed body and of the presence in the vicinity of all suspicious or disorderly persons.

Countersigns and Paroles.

262. The **countersign** is a word given daily from the principal headquarters of a command to aid guards and sentinels in identifying persons who may be authorized to pass at night.

It is given to such persons as may be authorized to pass and repass sentinels' posts during the night, and to officers, p. os., and sentinels of the guard.

263. The **parole** is a word used as a check on the countersign in order to obtain more accurate identification of persons. It is imparted only to those who are entitled to inspect guards and to commanders of guards.

The parole or countersign, or both, are sent sealed in the form of an order to those entitled to them.

264. As the communications containing the parole and countersign must at times be distributed by many orderlies, the parole intrusted to many officers, and the countersign and parole to many officers and sentinels, and as both the countersign and parole must, for large commands, be prepared several days in advance, there is always danger of their being lost or becoming known to persons who would make improper use of them; moreover, a sentinel is too apt to take it for granted that any person who gives the right countersign is what he represents himself to be; hence for outpost duty there is greater security in omitting the use of the countersign and parole, or in using them with great caution. The chief reliance should be upon personal recognition or identification of all persons claiming authority to pass.

Persons whose sole means of identification is the countersign, or concerning whose authority to pass there is a reasonable doubt, should not be allowed to pass without the authority of the p. o. of the guard after proper investigation; the p. o. will take to his next superior any person about whom he is not competent to decide.

265. In the Army, the **countersign** is usually the name of a battle; the **parole**, that of a general or other distinguished person.

266. When they can not be communicated daily, a series of words for some days in advance may be sent to posts or detachments that are to use the same parole or countersign as the main body.

267. If the countersign be lost, or if a member of the guard desert with it, the commander on the spot will substitute another for it and report the case at once to headquarters.

268. In addition to the countersign, use may be made of preconcerted signals, such as striking the rifle with the hand or striking the hands together a certain number of times, as agreed upon. Such signals may be used only by guards that occupy exposed points.

They are used before the countersign is given, and must not be communicated to any one not entitled to know the countersign, Their use is intended to prevent the surprise of a sentinel.

In the daytime signals, such as raising a cap or handkerchief in a prearranged manner, may be used by sentinels to communicate with the guard or with each other.

Guard Patrols.

269. A guard patrol consists of one or more men detailed for the performance of some special service connected with guard duty.

If the patrol be required to go beyond the chain of sentinels, the officer or p. o. in charge will be furnished with the countersign, and the outposts and sentinels warned.

If challenged by a sentinel, the patrol is halted by its commander, and the p. o. accompanying it advances alone and gives the countersign.

Watchmen.

270. Enlisted men may be detailed as watchmen or as overseers over prisoners, and as such will receive their orders and perform their duties as the commanding officer may direct.

Compliments from Guards.

271. The compliment from a guard consists in the guard turning out and presenting arms. (See Art. 139.) No compliments will be paid between retreat and 8 a. m. except as provided in Arts. 2232 and 2233, nor will any person other than those named in Art. 272 receive the compliment.

Though a guard does not turn out between retreat and 8 a. m. as a matter of compliment, it may be turned out for inspection at any time by a person entitled to inspect it.

272. Between 8 a. m. and retreat the following persons are entitled to the compliment:

Officials and personages entitled to gun salutes as prescribed in Art. R 1143, U. S. N. R.; flag and general officers; the commandant of a military or naval post, station or district, or the commanding officer of a vessel of the Navy, if of or above the rank of lieutenant commander; the commanding officer; and the officer of the day.

273. Guards will turn out and present arms when the national, regimental, or battalion colors, not cased, are carried past by a guard or an armed party. This rule also applies when the party carrying the colors is at drill. If the drill is conducted in the vicinity of the guardhouse, the guard will be turned out when the colors first pass and not thereafter.

274. In case the remains of a deceased officer or man are carried past, the guard will turn out and present arms.

275. In time of war all guards will turn out under arms when armed parties, except troops at drill and reliefs or detachments of the guard, approach their post. (See Art. 142.)

276. The commander of the guard will be notified of the presence in camp or garrison of all persons entitled to have the guard turned out, except the commanding officer and the officer of the day.

General Rules Concerning Guard Duty.

277. All material instructions given to a member of the guard by an officer having authority will be promptly communicated to the commander of the guard by the officer giving them.

278. Whenever the guard or relief is dismissed, each member not at once required for duty will place his rifle in the arms rack, if they be provided, and will not remove it therefrom unless he requires it in the performance of some duty.

279. Without permission from the commander of the guard, members of the main guard, except orderlies, will not leave the immediate vicinity of the guard house. Permission to leave will not be granted except in cases of necessity.

280. Members of the main guard, except orderlies, will not remove their accouterments or clothing without permission from the commander of the guard. (Art. 155.)

Prisoners.

281. The commander of the guard will place a civilian in confinement on an order from higher authority only, unless such civilian is arrested while in the act of committing some crime within the limits of the military jurisdiction; in which case the commanding officer will be immediately notified.

282. A prisoner after his first day of confinement, and until his sentence has been duly promulgated, is considered as held in confinement by the commanding officer. After due promulgation of his sentence, the prisoner is held in confinement by authority of the officer who reviews the proceedings of the court awarding sentence. The commander of the guard will state in his report, in the proper place, the name of the officer by whom the prisoner was originally confined.

283. The sentences of prisoners will be read to them when the order promulgating the same is received. The officer of the guard,

or the officer of the day if there be no officer of the guard, will read them, unless the commanding officer shall direct otherwise.

284. Prisoners awaiting trial by, or undergoing sentence of, a general court-martial, and those confined for serious offenses, will be kept apart, when practicable, from those confined by sentence of an inferior court, or for minor offenses. Enlisted men in confinement for minor offenses, or awaiting trial or the result of trial for the same, will ordinarily be sent to work under charge of unarmed overseers instead of armed sentinels, and will be required to attend drills unless the commanding officer shall direct otherwise.

285. The food of prisoners will, when practicable, be sent to their places of confinement, but post commanders may arrange to send the prisoners, under proper guard, to their messes for meals.

Enlisted men bringing meals for the prisoners will not be allowed to enter the prison room.

286. With the exception of those specially designated by the commanding officer, no prisoners will be allowed to leave the guardhouse unless under charge of a sentinel and passed by an officer or p. o. of the guard.

287. Prisoners reporting themselves sick at sick call, or at the time designated by the commanding officer, will be sent to the sick bay under charge of proper guard, with a sick report kept for the purpose. The recommendation of the surgeon will be entered in the guard report.

The security of sick prisoners in the hospital devolves upon the surgeon, who will, if necessary, apply to the post commander for a guard.

288. Prisoners in charge of a sentinel or overseer are regarded as being in a military formation and do not salute.

289. If the number of prisoners confined at a post justifies it, the commanding officer may detail a commissioned officer as "officer in charge of prisoners." At posts where the average number of prisoners continually in confinement is less than 12, the detail of an officer in charge of prisoners will not be made.

Guarding Prisoners.

290. The sentinel at the post of the guard has charge of the prisoners except when they have been turned over to the prisoner guard or overseers. (Arts. 284 to 293.)

(a) **He will allow none to escape.**

(b) **He will allow none to cross his post leaving the guardhouse except when passed by an officer or petty officer of the guard.**

(c) **He will allow no one to communicate with prisoners without permission from proper authority.**

(d) **He will promptly report to the p. o. of the guard any suspicious noise made by the prisoners.**

(e) **He will be prepared to tell whenever asked how many prisoners are in the guardhouse and how many are out at work or elsewhere.**

Whenever prisoners are brought to his post, returning from work or elsewhere, he will halt them and call the p. o. of the guard, notifying him of the number of prisoners returning. Thus: "**Petty officer of the guard (so many) prisoners.**"

He will not allow prisoners to pass into the guardhouse until the p. o. of the guard has responded to the call and ordered him to do so.

291. The prisoner guard and overseers will be commanded by the police officer; if there be no police officer, then by the officer of the day.

292. Details for prisoner guard are marched to the guardhouse and mounted by being inspected by the commander of the main guard, who determines whether all of the men are in proper condition to perform their duties and whether their arms and equipments are in proper condition, and rejects any men found unfit.

293. When prisoners have been turned over to the prisoner guard or overseers, such guards or overseers are responsible for them under their commander, and all responsibility and control of the main guard ceases until they are returned to the main guard.

294. If a prisoner attempts to escape, the sentinel will call "Halt." If he fails to halt when the sentinel has once repeated his call, and if there be no other possible means of preventing his escape, the sentinel will fire upon him.

295. A sentinel shall not use more force or violence to prevent the escape of a prisoner than is necessary to effect that object, but if the prisoner, after being ordered to halt, continues his flight, the sentinel may maim or even kill him, and it is his duty to do so.

296. Members of the prisoner guard and overseers placed over prisoners for work will receive specific and explicit instructions covering the required work; they will be held strictly responsible that the prisoners under their charge properly and satisfactorily perform the designated work.

Flags and Colors.

297. It is the duty of the commander of the guard to see that the proper flag is hoisted. In case of storm, either wind or rain, he will see that a storm-flag is promptly substituted.

The flag shall be hoisted at 8 a. m. and lowered at sunset.

The national flag will always be displayed at the time of firing salutes.

The sentinel at the guardhouse, or the sentinel nearest the flagstaff, will report at once to the p. o. of the guard any danger to the flag, from loosened halyards, or from entanglement with either halyards or staff.

298. When practicable, a detail consisting of a p. o. and two men of the guard will hoist or lower the flag. This detail is formed in line, with side arms, or if the special equipments do not include side arms, then with belts only, the p. o. carrying the flag, in the center, and is marched to the staff. The flag is then securely attached to the halyards and is rapidly hoisted at the sounding of the first note of the National Anthem or of the bugle, if no band be present. The halyards are then securely fastened to the cleat on the staff. The detail will salute the colors as required by the Navy Regulations.

299. When the flag is to be lowered, the halyards are cast off from the staff and made perfectly free. At sunset the flag is slowly lowered, so as to reach the ground at the sounding of the last note of the National Anthem or the "color's" call, as the case may be. It is then neatly made up and the halyards fastened. The detail is then re-formed and marched to the guardhouse, where the flag is turned over to the commander of the guard.

Reveille and Retreat Gun.

300. The morning and evening guns will be fired by a detachment of the guard consisting of a p. o. and two men. The morning gun is fired at the first note of the reveille, or, if marches be played before the reveille, it is fired at the commencement of the first march. The retreat gun is fired at the last note of the retreat.

The p. o. marches the detachment to and from the piece, and the piece is fired, sponged, and secured under his direction.

Sec. II.—EXTERIOR GUARDS.

General Principles.

301. Security embraces all of those measures taken by a command to protect itself from observation or surprise by the enemy. This is obtained by covering the immediate front of the command with detachments.

In camp or bivouac these detachments are called **outposts**, On the march they are called **advance, flank,** or **rear guards.**

302. As the principal duty of these bodies is the same, there is a general similarity in the formations assumed by them.

There is (1) a group, or line of groups, in observation; then (2) the support, or line of supports, whose duty is to furnish the observation groups, and check the enemy pending the arrival of reinforcements; still farther in rear is (3) the reserve. When practicable, the integrity of tactical units is preserved.

In mixed commands infantry usually forms the greater part of the troops detailed to the service of security. The kind and amount of artillery are determined by circumstances.

Troops on the service of security pay no compliments; individuals salute when they address, or are addressed by, a superior officer.

OUTPOSTS.

General Considerations.

303. An outpost is a covering detachment detailed to secure a camp, cantonment, bivouac, or a defensive position against surprise, to prevent an attack upon it before the troops can prepare to resist, and to deny to the enemy observation into their dispositions and movements.

The outpost carries out such reconnaissance as is necessary for the security of the resting troops. When in contact with the enemy, it is responsible that such contact is not lost when the enemy withdraws in front of the position.

304. The size and the dispositions of the outpost will depend upon many circumstances, such as the size of the whole command, the proximity of the enemy, and the situation with respect to him, the nature of terrain, etc.

A suitable strength may vary from a very small fraction to one-third of the whole force. For a single company in bivouac, a few sentinels and patrols will suffice; for a large command, a more elaborate outpost system must be provided. It should be no stronger than is consistent with reasonable security.

The most economical protection is furnished by keeping close contact with the enemy by means of outpost patrols, in conjunction with resisting detachments on the avenues of approach.

305. In a brigade or smaller force on the march toward the enemy, the outpost is generally formed from the advance guard and is relieved the following day when the new advance guard crosses the line of outguards. In a retreat, the detail for outpost duty is generally made from the main body. The new outpost becomes the rear guard the following day.

306. When, as in large forces, an advance or a rear guard performs such duty for several days, the outpost during this period is furnished by the advance or the rear guard, and orders for the establishment of the outpost are issued by the advance or the rear-guard commander.

When the command is small and stationary for several days, the outpost is relieved daily. In large commands, the outpost will, as a rule, be relieved at intervals of several days. The period of outpost duty will largely depend on the severity of the service.

307. The positions held by the subdivisions of the outpost are generally prepared for defense, but conditions may render this unnecessary.

Troops on outpost keep concealed as much as is consistent with the proper performance of their duties; especially do they avoid appearing on the sky line.

308. Composition.—A mixed outpost is composed principally of infantry. The infantry is charged with the duty of local observation, especially at night, and with resisting the enemy long enough for the main body to prepare for action.

Artillery is useful to outposts when its fire can sweep defiles or large open spaces and when it commands positions that might be occupied by hostile artillery. The guns are carefully concealed or protected and are usually withdrawn at night.

Machine guns are useful to command approaches and check sudden advances of the enemy.

Pioneers may be attached to an outpost to assist in constructing entrenchments, clearing the field of fire, and opening communications laterally and to the rear.

The supreme commander generally retains control of the signalmen and establishes a line of information to the reserve and from the reserve to each support and important detached post.

Distribution of Outpost Troops.

309. The outpost will generally be divided into three parts. These, in order from the main body, are the reserve, the **line of supports** and the **line of outguards.**

The distances separating these parts, and their distance from the main body, will depend upon the object sought, the nature of the terrain, and the size of the command. There can be no uniformity in the distance between supports and reserve, nor between outguards and supports, even in the same outpost. The avenues of approach, facilities for observation, and other important features of the terrain will largely control their exact position.

The outpost of a small force should ordinarily hold the enemy beyond effective rifle range of the main body until the latter can deploy. For the same purpose the outpost of a large force should hold the enemy behond artillery range.

310. The **reserve** constitutes the main body of the outpost and is held at some central point from which it can readily *support the troops in front by reinforcement or counterattack or hold a rallying position* on which they may retire. It is generally located near the principal route leading from the enemy.

The reserve may be omitted when the outpost consists of less than two companies.

The reserve may comprise one-fourth to two-thirds of the strength of the outpost.

311. The supports constitute the line of **resisting units** of the outpost. They are the principal agencies of security of the outpost. In outposts equalling or exceeding the strength of a battalion, a support is usually constituted by a company.

The supports are numbered consecutively from right to left. They are placed at the more important points on the outpost line, usually on or near the line on which resistance is to be made in case of attack. Supports hold their positions, unless the orders of the outpost commander prescribe otherwise.

312. The movement of troops when not engaged in combat is for the most part confined to roads. As a general rule, therefore, roads exercise the greatest influence on the location of supports, and a support will generally be placed on or near a road. The sector which it is to cover is clearly defined by means of tangible lines on the ground and is such that the support is centrally located therein.

Supports insure their own security by means of outguards and patrols.

313. The outguards comprise small detachments established by the supports of their own security and for the observation of the sector assigned to them. For convenience, they are classified as **pickets, sentry squads,** and **cossack posts.** They are numbered consecutively from right to left in each support.

Posts at a short distance from the support may be held by weak outguards (cossack posts, sentry squads) while important posts at a considerable distance must be more strongly held (pickets).

314. A picket is a group consisting of two or more squads, ordinarily not exceeding a platoon, posted in the line of outguards to cover a given sector. It furnishes patrols and one or more sentinels, double sentinels, sentry squads, or cossack posts for observation.

Pickets are placed at the more important points in the line of outguards, such as road forks. The strength of each depends upon the number of small groups required properly to observe its sector.

315. A **sentry squad** is a squad posted in observation at an indicated point. It posts a double sentinel in observation, the remaining men resting near by and furnishing the reliefs of sentinels. In some cases it may be required to furnish a patrol.

316. A **cossack post** consists of four men. It is an observation group similar to a sentry squad, but employs a single sentinel.

317. At night, it will sometimes be advisable to place some of the outguards or their sentinels in a position different from that which they occupy in the daytime. In such case, the ground is carefully studied before dark, and the change made at dusk. Where an outpost occupies a position for a considerable length of time in close proximity to the enemy, provision for a frequent change in the position of outguards must be made in order to avoid their capture by hostile raiding parties.

318. **Sentinels** are generally used singly in daytime, but at night double sentinels will be required in most cases. Sentinels furnished by cossack posts or sentry squads are kept near their groups; those furnished by pickets may be as far as 100 yards away.

Every sentinel should be able to communicate readily with the body to which he belongs.

319. Sentinel posts are numbered consecutively from right to left in each outguard. Sentry squads and cossack posts furnished by pickets are counted as sentinel posts.

320. The arc of observation for which each sentry is responsible is clearly defined by definite terrain lines or points.

321. Instead of using outguards along the entire front of observation, part of this front may be covered by **patrols** only. Patrols are used to cover such sections of the front as can be crossed by the enemy only with difficulty and over which he is not likely to attempt a crossing after dark. They may also be used to supplement and extend the observation of sentries at night.

In daylight, much of the local patrolling may be dispensed with if the country can be seen from the posts of the sentinels. Patrols should, however, frequently be pushed well to the front unless the ground in that direction is exceptionally open.

322. Patrols or sentinels must be the first troops which the enemy meets, and each echelon in rear must have time to prepare for the blow. These echelons cause as much delay as possible without sacrificing themselves and gradually retire to the line where the outpost is to make its resistance.

323. Patrols must be used to keep up connection between the parts of the outpost except when, during daylight, certain fractions or groups are mutually visible. After dark this connection must be maintained throughout the outpost, except where the larger subdivisions are provided with wire communication. Wire communication should extend as far forward as the supports.

324. In addition to the ordinary outguards, the outpost commander may detail from the reserve one or more **detached posts** to cover roads or areas or occupy important observation points not in the general line assigned to the supports.

In like manner, the commander of the whole force may order detached posts to be sent from the main body to cover important roads or localities not included in the outpost line.

The number and strength of detached posts are reduced to the absolute needs of the situation.

Prominent points within the outpost position in rear of the outguards which afford views over the foreground are occupied as observation posts.

325. When combat is imminent, the necessity for unity of command will usually require the establishment of separate outposts or outguards by the smaller units (regiments, battalions, or companies) in the first line. Higher commanders insure contact and cooperation between adjacent units.

When battle is interrupted by nightfall and troops bivouac on the battlefield, each first-line company insures its own security by posting outguards and sending out patrols.

Orders for Sentinels on Outpost.

326. The following instructions for sentinels on outpost correspond to the "General orders" of interior guards. They are of the greatest importance and all detachments on outpost duty must be thoroughly familiar with them:

1. **About myself and friendly neighbors.**

"My post is number———, outguard number———. The outguard is *there*. The post on my right is number ———, outguard number———, and is *there*. The post on my left is number———, outguard number———, and is *there*. The support is *there*. Other detachments are *there* and *there*. *Such* and *such* patrols are operating in my front. This road leads to———."

2. **About the enemy.**

"The enemy is reported to be *there*. I have seen him (describing exactly what hostile bodies I have seen) *there;* or, I have not seen him. I am to watch for him between *there* and *there*. If I see any unusual movement I am to report it at once to my outguard commander, who is *there*. If suddenly attacked and forced to retire or threatened with capture, I shall rejoin my outguard by going around *that way* so as not to disclose the position of my outguard to the enemy or to mask its fire."

3. **How to conduct myself on my post.**

"By day I shall make the best use possible of such natural or artificial cover as is available, standing, crouching, or lying down, and remaining stationary or moving about as will enable me to observe the sector assigned me to watch in the most efficient manner. I shall carry my piece at will, loaded and locked. I shall inform passing friendly patrols of what I have seen.

"At night I shall remain standing, habitually stationary, moving about only for the purpose of observation. I shall not sit or lie down unless authorized to do so."

4. **When to fire on the enemy.**

"Unless specially ordered to fire on the enemy whenever seen, I shall fire only under the following circumstances:

"(a) When suddenly attacked and there is no time to call the outguard commander, I shall fire rapidly but with careful aim.

"(b) When a person approaching my post is ordered to halt and fails to do so, or otherwise disobeys me, I shall fire deliberately, taking careful aim, so as to be sure to stop him."

5. **Treatment of individuals approaching my post.**

"By day I shall allow only officers, petty officers, and detachments recognized as part of the outpost, and officers known to have authority to do so, to pass my post either in or out. I shall detain all others and notify my outguard commander.

"At night when any persons approach my post, I shall come to a ready, halt them, and notify the outguard commander. Persons claiming to be deserters from the enemy are required to lay down their arms. If they are pursued by the enemy, I shall order them to drop their arms and I shall give the alarm. If they fail to obey me at once, I shall fire on them. I shall halt bearers of flags of truce and their escorts, require them to face outward, and at once notify the commander of the outguard."

Establishing and Relieving the Outpost.

327. **Establishing the outpost.**—The outpost is posted as quickly as possible, so that the troops can the sooner obtain rest. Until the leading outpost troops are able to assume their duties, temporary protection, known as the **march outpost,** is furnished by the nearest available troops.

328. The halt order of the commander, besides giving the necessary information and assigning camp sites to the parts of the commnad, details the troops to constitute the outpost, assigns a commander therefor, designates the general line to be occupied, and, when practicable, points out the position to be held in case of attack.

329. The outpost commander, upon receipt of this order, issues the outpost order with the least practicable delay; it is of the first importance that the most essential measures be rapidly executed (e. g., occupation of important road connections). In large commands, it may often be necessary to give the order from the map, but usually the outpost commander will have to make some preliminary reconnaissance, unless he has an accurate and detailed map.

The order gives such available information of the situation as is necessary to the complete and proper guidance of subordinates, designates the troops to constitute the supports, assigns their location and the sector each is to cover, provides for the necessary detached posts, indicates any special reconnaissance that is to be made, orders the location and disposition of the reserve, and informs subordinates where information will be sent.

330. Generally it is preferable for the outpost commander to give verbal orders to his support commanders from some locality which overlooks the terrain. The time and locality should be so selected that the support commanders may join their commands and conduct them to their positions without causing unnecessary delay to their troops. The reserve commander should, if possible, receive his orders at the same time as the support commanders. Subordinates to whom he gives orders separately should be informed of the location of other parts of the outpost.

In large outposts written orders are frequently most convenient.

After issuing the initial orders, the outpost commander inspects the outpost, completes his dispositions by more detailed orders, and sends his superior a report of his dispositions. He prescribes the degree of readiness for action and the conduct to be observed in case of attack.

He takes post where messages can most easily reach him and from which his orders can best be transmitted. His post must always be easy to find, especially at night. He must have at hand the necessary runners, cyclists, and mounted orderlies.

331. The reserve is marched to its post by its commander, who then sends out such detachments as have been ordered and places the rest in camp or bivouac, over which at least one sentinel should be posted. Connection must be maintained with the main body, the supports, and nearby detached posts. The place of formation in case of alarm must be clearly designated and understood by all members of the reserve.

332. The supports march to their posts, using the necessary covering detachments when in advance of the march outpost. A support commander marches with the advanced elements of his support, reconnoiters the ground and prepares to issue his order. The order fully explains the situation to subordinates, or to the entire command if it be small. It details the troops for the different outguards, or designates the units to furnish the outguards, and when necessary, defines the sector each is to cover and the patrolling to be carried out. It provides the necessary sentinels at the post of the support, the patrols to be sent thereform, and arranges for the necessary intrenching, construction of barricades, etc. Connection is maintained with adjoining supports and with the outguards furnished by the support.

333. In posting his command, a support commander seeks to cover his sector in such manner that the enemy can not reach the position of his support in dangerous numbers and unobserved, or pass by it within the sector intrusted to it. On the other hand, he must economize men on observation and patrol duty, for these duties are unusually fatiguing. He must practice the greatest economy of men consistent with the requirements of practical security.

334. As soon as the posting of the support is completed, its commander inspects the disposition and corrects defects, if any, and reports the disposition of his support, including the patrolling ordered, to the outpost commander. This report is preferably made by means of a sketch. Dispositions are also communicated to adjacent supports.

335. Each outguard is marched by its commander to its assigned station, and especially in the case of a picket, is covered by the necessary patrolling to prevent surprise.

Having reached the position, the commander explains the situation to his men and establishes reliefs for each sentinel and if possible, for each patrol to be furnished. Besides these sentinels and patrols, a picket must have a sentinel at its post.

The commander then posts the sentinels and points out to them the principal features, such as towns, roads, and streams, and gives their names. He gives the direction and location of the enemy, if known, and of adjoining parts of the outpost.

He gives to patrols the same information and the necessary orders as to their routes and the frequency with which the same shall be covered. Each patrol should, when practicable, go over its route once before dark.

The reliefs pertaining to each sentry post accompany the first relief at the original establishment of the post. The outguard commander prescribes whether they are to return to the post of the outguard or remain near the sentry on post as a sentry squad or cossack post.

336. Every picket maintains connection by patrols with outguard on its right and left. Each commander takes precautions to conceal his outguard and generally strengthens his position by intrenching.

337. **Relieving the outpost.**—Evening and shortly before dawn are hours of special danger. The enemy may attack late in the day in order to establish himself on captured ground by intrenching during the night; or he may send forward troops under cover of darkness in order to make a strong attack at early dawn. Special precaution is therefore taken at those hours by holding the outpost in readiness, and by sending patrols in advance of the line of observation. If a new outpost is to be established in the morning, it should arrive at the outpost position at daybreak, thus doubling the outpost strength at that hour.

338. **Examining post.**—An examining post is a small detachment under the command of an officer or a p. o., stationed at some convenient point to examine strangers and to receive bearers of flags of truce brought in by the outguards or patrols.

Though the employment of examining posts is not general in field operations, there are many occasions when their use is important; for example, when the outguards do not speak the language of the country or of the enemy; when preparations are being made for a movement and strict scrutiny at the outguards is ordered; at sieges, whether in attack or defense. When such posts are used, strangers approaching the line of observation are passed along the line to an examining post.

No one except the commander is allowed to speak to persons brought to an examining post. Prisoners and deserters are at once sent under guard to the rear.

Sec. III.—SECURITY IN POSITION WARFARE.

General.

339. In case the position held by the front-line troops is not favorable for defensive combat or when for other reasons it is inadvisable to offer the main resistance to a serious hostile attack in an advance position, a defensive position is selected further to the rear, and the ground in front lightly held by an outpost. This arrangement is especially necessary when the end of an engagement leaves our troops in a disadvantageous position for fighting a defensive engagement.

When an outpost zone is not held, the line of resistance is, as a general rule, preceded by a line of observation held by outguards detailed by first-line companies.

The general principles of security set forth in preceding paragraphs of these regulations are applicable to position warfare. More detailed prescriptions which are the consequence of the stationary character of position warfare are treated in succeeding paragraphs.

340. Position warfare permits of the development of a highly organized service of security and observation and requires in part the training of a specialized personnel. The organization of this service comprises: (1) guard service of the position; (2) observation posts; (3) night patrols in front of the accessory defences; (4) sniper's posts.

Guard Service.

341. The first-line platoons are the principal organs of the guard service of the position. They furnish the sentry posts for the line of observations and the advanced posts.

Units in rearward echelons establish such sentries as are necessary to insure their own readiness for action and for giving the alarm in case of gas attack. At least one sentry for each shelter is posted.

342. One officer in each company and one petty officer in each platoon is constantly on duty. They are responsible to their respective commanders for the service of security of their units. They make frequent inspections to assure themselves of the vigilance of the sentries and observers and their proper instruction and ascertain whether they have any information about the enemy to report.

343. The duties of the petty officer on guard are:

To familiarize himself with the location and exact duties of each combat group of the platoon;

To insure that sentries are alert, rifles loaded, gas-alarm apparatus in readiness;

To verify the condition of loopholes;

To verify the orders, written or verbal, which sentries transmit to each other;

To make known to sentries the time of departure and return of patrols and their itinerary;

To keep the flare pistol and fire it if suspicious noises are heard;

To report to the officer on watch and the platoon leader all incidents of his tour and the arrival of a superior officer;

To transmit to his successor the written or verbal orders and the panoramic sketch of the portion of the hostile position under observation.

344. Sentries may be posted directly from the first-line platoons by the petty officer on guard or from a sentry squad or cossack post.

345. Each sentry must be informed as to location of the post of his platoon leader and that of the sentry on each side and as to whether there are any patrols or working parties in front. Should there be any salients in our line, the sentry is instructed so as to avoid any possibility of his firing toward our trenches. All sentries are instructed as to the method of giving the gas alarm. At night, sentries are posted at the entrance to all shelters to arouse the occupants in case of attack or gas alarm. They are similarly posted during hostile bombardment to give warning when the enemy debouches for attack.

Sentries make as little noise as possible in challenging and advancing parties.

346. During the day, sentries observe through loopholes or by means of a periscope; at night, they observe over the parapet.

347. Listening posts are advanced sentry posts (usually cossack posts) established at night to warn the front-line garrison of the approach of hostile raiding or attacking parties.

When the listening post is connected with the front-line trench by a communicating trench, arrangements must be made for blocking or barricading the latter by the sentinel who falls back after giving the alarm (see Figure 67).

348. As advanced posts are easy prey for hostile raiding parties, their habitual use should be avoided and should be resorted to only when it has been impossible to precede the line of resistance by an observation parallel or for certain specific purposes such as observation of the accessory defenses when these are very wide, flanking the front of the trenches, etc.

349. Sentries are relieved every two hours except under unusual conditions. The number of sentries varies with the proximity of the enemy's trenches, the character of the enemy, the nature of our own defenses, the field of view to the front, and the distribution of our own troops. A larger number of sentries is required at night than during the day.

350. The primary function of sentries is to insure the immediate readiness of the command in case of hostile attack and to offer the first resistance to the enemy's advance. The continuous surveillance of the hostile position for the purpose of collecting information relative to the enemy is carried out by the observation posts.

Both sentries and observers serve as lookouts.

Observation.

351. The functions of observation posts are:

(*a*) To gather information relative to the enemy; his daily life, habits, emplacements of his guns, movements carried out near the front, etc.;

(*b*) To give the alarm in case of attack.

352. Each unit (platoon, company, battalion, etc.) furnishes the personnel for its own observation posts.

353. The posts of commanders should be established near their observation posts. The choice of the latter precedes that of the former. In each unit, a sufficient number of posts should, when practicable, be established to insure that the entire sector of the unit is under continuous observation.

354. The essentials of a good observation post are good field of view, concealment, and sufficient space for two men. The design of the post should permit of construction in a single night and the post should be rain proof and splinter proof. The equipment of the post will vary with its importance and the field of view. The more important posts should be equipped with a telescope, an alidade, map, panoramic sketch, luminous compass, protractor, luminous watch, notebook, and pencil.

355. Except in the first-line companies, observation posts should, when practicable, be located at some distance from the trenches so that they will not be included in the fire directed against them. Placing the observation posts near prominent points of the terrain should be avoided. Men should be prohibited from walking about in the vicinity of observation posts. The posts and the passages leading to them should be carefully concealed and camouflaged. The formation of paths converging at a post should be particularly avoided.

For better protection and concealment, observation posts should when practicable be oblique to the front (Fig. 3).

356. Some men are naturally better qualified as observers than others; ability is developed by practice. The training of good observers is a matter of the greatest importance. They must not only be able to see without being seen, but they must have tenacity and patience to observe. The responsibility for their training rests on the company, battalion, or regimental officers under whose daily control the observers serve.

357. Each platoon should have at its disposal at least 6 observers of keen vision who are good shots. They alternate on duty in order to insure continuity of observation and are excused from certain other duties.

358. Observers thoroughly familiarize themselves with their sectors of observation by a detailed study of the terrain, of the panorama of the observation post, of maps of the sector, and of photographs. They are instructed in the use of the matériel of the observation post.

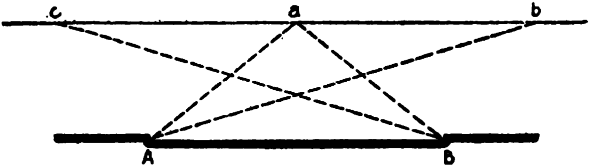

FIG. 3.—*a b* Part of enemy's trench observed by lookout A. *a c* Part of enemy's trench observed by lookout B.

359. The observer should be particularly on the lookout in respect to:

Enemy sentries, snipers, working parties, and any points where he indicates his presence by periscopes, etc.;

Enemy trenches: saps, lookout posts, loopholes, breaches in trench, signs of reliefs, occupied sections, dugouts, new work, latrines, depots;

Wire: gaps, new wire, tracks of patrols through wire;

Mining: signs of soil excavated and materials carried;

Gas and liquid fire: indications, such as the escape of gas after shelling, suspicious emplacements;

Batteries: activity, nature of guns, shells and direction;
Lights: signals, rockets, flares, and searchlights;
Weather: wind (direction and force); visibility;
Airplanes and balloons.

The least change in the enemy lines (obstacles, ground dug up), or any other indication of preparation for an attack should be reported to the watch officer or p. o. Observers watch particularly the points to which their attention has been drawn by preceding observers and upon which they may hope to fire with success.

Patient, attentive observation always gives valuable information about the enemy's customs (time for reliefs, supplies, etc.).

Dust blown up by a shot, or smoke from a cigarette may reveal a loophole habitually occupied. Earth thrown up indicates that a fatigue party is constructing a dugout or fieldwork. A small earth heap and smoke reveal the location of a dugout. Study of the battle map and of aerial photographs may show the location of crossroads and the most important communication trenches, upon which it is always advisable to fire with trench mortars at hours when they are supposed to be occupied.

Every effort should be made to locate machine guns, trench mortars, observation posts, etc., and to interpret the presence of the smallest object or any unusual sign appearing on the enemy's side. This information is indispensable in case we attack, and also to insure the daily wearing down of the enemy.

360. The observers combine their special work with giving the alarm by the means at hand in case of surprise attack or an attack preceded by a bombardment; giving the gas alarm; observing and repeating the prearranged signals. Observation posts must possess sure and rapid means of transmitting information to the units to be warned. Facility of communication should be considered in locating the post.

361. Observers in rearward echelons repeat signals and rockets from the first line.

Night Patrols.

362. Observation is supplemented during the night by the reconnaissance of patrols detailed by the c. c. or the bn. c.

The missions of night patrols may be:

To gain information relative to enemy troops or enemy defensive works; to capture prisoners; to kill or harass the enemy.

These patrols always have a definite mission: To reconnoiter such point; to prepare an ambush at such place, etc. For the general mission of protection of the front line, stationary listening posts are more effective than patrols.

363. The officer sending out the patrol determines the time and point at which it will leave the lines (through hidden passages prepared in the barbed wire or from a listening post), the route, and the probable time and place of return. This information is communicated to watch officers and p. os., neighboring companies, and artillery, trench-mortar, and machine-gun units covering the sector.

364. Night patrolling should be systematically organized. For troops just commencing the occupation of a stabilized sector, the reconnaissances to be carried out should embrace:

(a) Our own front line and accessory defenses in front of it.

(b) Shell craters and old trenches between our front line and the hostile front line.

(c) Enemy wire, saps, listening posts.

These reconnaissances should as a rule be carried out in the order stated.

365. Reconnaissance of our own wire is first carried out for the purpose of ascertaining its condition and in order to locate gaps for the purposes of exit and entry. Landmarks on our own parapet are also located for purposes of subsequent orientation when opertaing in "no man's land." By taking bearings on these landmarks, patrols will be able to determine their own position at any time and render accurate report as to the location of objects reconnoitered.

366. Shell craters and old trenches are next reconnoitered to determine whether they are occupied by the enemy, and if so, the strength of the post, the state of wire protection, practicability of raiding the post, etc.

367. In investigating the enemy's wire, it is generally best to work from one or both flanks inward. The starting point is located by taking a bearing from some point within our own lines or from a sap head. The stopping point should similarly be located by bearings on prominent objects in our own back area or within the enemy's lines. When reporting on wire, the following points should be observed:

1. Strength, height, depth, thickness or density, number of lines of wire.

2. Distance of inner line from enemy front line, distance between lines, map location of portion examined.

3. Gaps: Map location, width, whether straight or zigzag, whether left purposely for passage of enemy patrols or cut by our gunfire.

4. Effect of our recent gun or trench-mortar fire.

5. Nature of construction: Apron wire, chevaux-de-frise, barbed, whether wooden or metal screw stakes are used, etc.

6. New work: position and extent and probable date of construction.

Whenever investigating a gap for a raid, it is imperative that the patrol leader go completely through it in order to be certain that no obstacle to the passage exists.

368. Patrols sent out to gain information should not fight unless it is necessary to do so to accomplish their mission.

These patrols should be small in numbers (2 to 5 men).

Patrols sent out for the capture of prisoners should be stronger than reconnoitering patrols (5 to 15 men).

369. Before departure, patrols should have studied the ground to be covered from maps, airplane photographs, and observation posts. In case the mission is the capture of prisoners, they should be familiar with the habits of the enemy, the routes followed by his patrols, the location of his sentries, listening posts, advanced posts, etc. The best means of capturing a hostile patrol is the preparation of an ambush along its route; stalking hostile patrols should in principle be avoided.

Patrols for the protection of working parties should select a good covering position and avoid unnecessary movement.

370. Before departure, the patrol leader examines the equipment of the patrol to see that it makes no noise. Patrols should never wear steel helmets as they click when they hit a piece of barbed wire, show an unmistakable outline, and prevent crawling with the face on the ground. Revolvers and grenades are usually the only arms carried. Rifles are too unwieldly and noisy and soon become unserviceable due to clogging with mud. Hands and face and the outside of revolvers should be stained with mud. Men subject to cough should carry gum as a preventive; a cough close to the enemy is certain means of detection. All forms of identification such as identity disks, insignia, and letters should be removed. Luminous watches and compasses should be covered. All men of the patrol should know the time and place of departure, the route to be followed, the time and place of return, and the signals for communication with each other.

371. For the purposes of better observation by the patrol, flares may be sent up from our front-line trench at prearranged times. When the time comes for the flare to be fired, the entire patrol must be in shell holes or under cover. Care must be taken that the flare is so fired as to pass over the heads of the patrol. A flare falling behind the patrol will throw it into relief and expose it to hostile view. A light dropping just in front of the hostile front line blinds the enemy and shows up the wire very plainly to the patrol. If the light goes beyond the hostile trench, it does not blind the enemy but still shows up the wire very plainly to the patrol. The best time to observe is while the light is still in the air and before it has passed over the hostile front line. While the patrol is out, no other flares must be fired near the place where it is working.

A patrol should remain motionless the moment a flare goes up. The best time to move is when it has just gone out.

372. The formation of the patrol will vary according to circumstances. Generally, some form of wedge formation which permits the patrol to form rapidly for action in any direction is most effective. Unless the night is very bright or many flares are being sent up, the patrol may advance by crouching or creeping to within 100 yards of the hostile line. Beyond this point, movement must be by crawling, using increasing care to within 15 or 20 yards of the enemy line, where movement is possible only by inches. During this latter stage of the advance, members of the patrol must be in constant physical touch with each other. One man must be constantly listening while the others are advancing. The route of advance selected should be in dead ground as far as possible. Care must be taken to avoid sky lines and get off the lips of shell craters as soon as possible.

The following method of crawling should be practiced:

Lie flat on the belly on the ground, heels down, left side of face on ground; extend arms forward overhead, being careful not to raise the head. Feel the ground in front and then bring back the hands to the side of the head. Pull up right leg and push the body forward, raising very slightly on the elbows. For faster traveling when farther away from the enemy, alternate movement on right and left side. Keep the heels down.

373. The return journey of the patrol should be made by a different route from that followed in its advance.

374. Patrol duty is an excellent means of elevating a soldier's courage. Volunteers should be called for in exceptional cases only.

Sniping.

375. The purpose of observation in the trenches is not only to give warning when the enemy leaves his trenches but continuously to watch for every detail which may take place within his defensive

organization and take advantage of his slightest movement for inflicting losses upon him.

Fire for the purpose of wearing him down should be the constnat object of all platoon leaders and troops and should not be slackened for fear of reprisals.

376. In the execution of harassing fire, observers and snipers frequently work in pairs, the observer indicating the targets discovered to the sniper and observing the results of his fire.

377. Sniping fire may be delivered from specially constructed sniping posts, from shell craters, sapheads, or other position outside the trenches, through loopholes in the parapet or over the parapet. The rifle may be laid in a fixed rest or on a sniperscope mounting or fired without special rest, using a telescopic sight or ordinary rifle sights modified to increase their visibility for night firing.

378. Sniping posts are so located and sectors of fire so assigned to each post as to cover the entire front. The posts must be located within 400 yards from the hostile front line. They may be in the first, second, or third trench, in approach trenches, in our own wire, in shell holes in front of our front line, or between our lines or in trees or houses. For each post, at least one alternative position should be selected.

Concealment is the most important element in the construction of snipers' posts. Background must be given careful consideration. The post may be concealed by the adaptation of various objects, such as an old boot with a loophole cut in the heel, spool of barbed wire, dummy sandbag, artificial tree stump, etc.

The design of snipers' posts must embody the following requisites:

The post must be capable of construction in one night;

It must afford sufficient space for two men;

It must be rain proof;

It must provide room for head and shoulders;

It must provide a rest for rifle and arm;

Loopholes must be pointed in the proper direction; the proper alignment may be insured by driving stakes on the line of fire;

A cover for the loophole must be provided;

There must be a curtain or other means of darkening the entrance.

379. The following precautions should be observed in the use of sniping posts:

The loophole should be masked when the curtain is drawn;

Smoking must not be permitted in the post;

Glittering objects should be kept out of sight;

The rifle should not be allowed to project too far beyond the loophole;

Care must be taken that shots do not kick up dust in front of the loophole and betray the location of the post.

If the post is discovered, it should be temporarily discontinued or completely abandoned, and a new location selected.

Sniping posts should be provided with a landscape sketch and a range card.

For night firing, provision must be made for blinding the flash of discharge by placing a double thickness of canvas or sandbag 18 or 20 inches in front of the muzzle. The screen should be removed before dawn.

380. The rifle may be laid by day on the objectives selected for night firing and clamped on its line of fire.

Favorable objectives are: Gaps in enemy's wire which will probably be repaired at night; sap heads; sentry and lookout posts; loopholes; dugouts; exposed points in approach trenches; machine guns spotted by their flashes.

381. Sniping fire may be employed in conjunction with the operations of patrols to distract the attention of the sentry at the point to be reconnoitered.

382. Targets are usually most numerous in the early morning or at dusk, and snipers should be particularly alert at these times. The sniper is at a disadvantage when he is facing the sun. He should if possible select the time for firing when the light is full on the ground where targets are expected and he himself is in a comparatively bad light. Additional protection from discovery may be secured by the use of camouflage clothing and by disguises improvised by using grass, leaves, etc., and by smearing hands, face, and equipment to harmonize with surroundings. Regular outline of any shape and abrupt movements must be avoided.

383. Provision should be made for firing on transient objectives which reveal themselves at night. For this purpose, a visible line of sight must be improvised or telescopic sights employed. A line of sight may be improvised by attaching a piece of white cotton to the front sight and a strip of white tape along the barrel from front to rear sight and by pasting a piece of white cardboard with a hole punched in center on the rear sight. An effective range of from 30 to 50 yards may be obtained in this manner. When a bright moon, effective fire at a range of 200 yards can be delivered with the telescopic sight.

384. Snipers must be skilled in working the bolt of the rifle an in loading noiselessly. To avoid long flashes, the barrel and bol must be absolutely dry. The sniper should remain in shadow occupy low ground, and try to get the enemy on the sky line. T draw targets or locate hostile snipers, some sort of decoy may b successfully employed. Effort should be made to locate the direction from which hostile sniping comes. Any casualty from rifle fir should be at once reported and investigated, and snipers especiall detailed to deal with hostile snipers responsible.

385. Rifle grenades are also used for the delivery of harassing fire For night firing, the rifle is registered by day on important objectives

Coordination and Transmission of Information.

386. Regulations relative to coordination and transmission information obtained through observation are contained in "I structions for Regimental Intelligence Service".

Tactical Conduct of Outposts.

387. The conduct of an outpost is essentially a defensive operatio The provisions of these regulations relative to the defensive appl to the conduct of an outpost in case of hostile attack and to the preparation of plans of outpost defense.

Sec. IV.—PATROLS.

388. The following paragraphs on patrols relate in particular t the conduct of the patrol and its leader, and apply to patrols employed in covering detachments as well as in combat reconnaissanc

389. A patrol is a detachment, varying in strength from two me to a company, sent out from a command to gain information of th country or of the enemy or his defenses, or to prevent the enem from gaining information. In special cases, patrols may be give missions other than these.

390. The commander must have clearly in mind the purpose f which the patrol is to be used in order that he may determine it proper strength, select its leader, and give the latter proper instructions.

391. The missions of patrols may be:

Before combat, to keep in touch with the enemy and observ his movements or to prevent the enemy from observing the movements of our own troops;

During combat, to keep in touch with units on the flanks and prevent the enemy from turning or attacking the flanks of our own forces;

After combat, to reconnoiter the enemy position or to seize tactical features in front of the line reached by the assaulting infantry, or to cover the consolidation of the line;

In general, to reconnoiter some portion of the enemy's forces or position, or some natural or artificial geographic feature, and obtain information relative thereto.

As a rule a patrol is sent out for one definite purpose only. Indefiniteness as to mission results in a hesitant and defensive attitude on the part of the patrol.

If the purpose is to gain information only, a small patrol is better than a large one. The former conceals itself more readily and moves less conspicuously. For observing from some point in plain view of the command or for visiting or reconnoitering between outguards, two men are sufficient.

If messages are to be sent back, the patrol must be strong enough to furnish the probable number of messengers without reducing the patrol to less than two men. If hostile patrols are likely to be met and must be driven off, or if the mission be the capture of prisoners, the patrol must be strong.

In friendly territory, a weaker patrol may be used than would be used for the corresponding purpose in hostile territory.

392. The character of the leader selected for the patrol depends upon the importance of the work in hand.

For patrolling between the groups or along the lines of an outpost, or for the simpler patrols sent out from a covering detachment, the average soldier will be a competent leader.

393. For a patrol sent out to gain information or for a distant patrol sent out from a covering detachment, the leader must be specially selected. He must be able to cover large areas with few men; he must be able to estimate the strength of hostile forces, to report intelligently as to their dispositions, to read indications, and to judge as to the importance of the information gained. He must possess endurance, courage, and good judgment.

The officer sending out the patrol verifies the detail, designates a second in command, and gives the necessary instructions. His instructions are full and clear. The patrol leader is given such information of the enemy and country as may be of value to him. He is informed as to the general location of his forces, particularly of those with whom he may come in contact. He must be made to understand exactly what is required of him, where to go, when to return, and where messages are to be sent or the patrol is to report. If possible, he is given a map of the country he is to traverse, and in many cases his route may be specified. Sentries are notified as to the patrols operating in their front.

The officer sending out the patrol must be certain that his instructions are understood.

Besides his arms and ammunition the patrol leader is equipped with a luminous compass, a watch, a pencil, a notebook, a flash light and when practicable, field message blanks and a map of the country.

The patrol leader assembles the men detailed for the patrol. He inspects their arms and ammunition and satisfies himself that they are in suitable condition for the duty. He sees that none has any papers, maps, etc., that would be of value to the enemy if captured. He sees that their accoutrements do not glisten or rattle when they move. He then repeats his instructions to the patrol and assures himself that every man understands them. He explains the signals to be used and satisfies himself that they are understood.

394. No normal formation for the patrol is, or should be, prescribed. The information and the movements of the patrol must be regulated so as to render probable the escape of at least one man in case the patrol encounters a superior force. The formation will depend upon the nature of the ground traversed and the cover afforded. The leader must adopt the formation and measures best suited to the accomplishment of his object.

In general it should have the formation of a main body with advance rear, and flank guards, though each be represented only by a single man.

395. The distances separating the members of the patrol vary according to the ground and the proximity of the enemy. If too close together, they see no more than one man; if too widely separated they are likely to be lost to the control of the leader. When at close range from an enemy whose position has been located and at night the formation of the patrol is relatively close.

396. In general, a patrol advances from one intermediate poin to another along its route of advance by bounds, successive position being reconnoitered as far as practicable before leaving the preceding position. The country must be carefully observed as the patrol advances. In passing over a hill, the country beyond is firs observed by one man; houses, inclosures, etc., are approched in a similar manner or avoided entirely; woods are generally reconnoitered in a thin skirmish line when the object is to determine whether they are occupied; in passing through woods on other missions, the patrol is kept together and protected by the necessary scouting.

397. In questioning civilians, caution is observed not to disclose any information that may be of value to the enemy. Strangers are not allowed to precede the patrol. Patrol leaders are authorized to seize telegrams and mail matter and to arrest individuals when necessary.

398. When a patrol is scattered, it reassembles at some point previously selected; if cut off, it returns by detour or forces its way through. As a last resort, it scatters so that at least one man may return with the information.

399. The strength and the composition of hostile troops must be observed. If they can not be counted, their strength may be estimated by the length of time a marching column consumes in passing a given point or by the area covered if in camp.

Infantry in column of squads may be assumed to occupy half a yard per man, cavalry in column of fours 1 yard per trooper, and artillery in single column 20 yards per gun or caisson. A given point is therefore passed in one minute by about 175 infantry; 110 cavalry at walk; 200 cavalry at trot; 5 guns or caissons. For troops in column of twos, this estimate is reduced by one half.

Patrol leaders should if practicable know the uniforms of the various enemy organizations in order that they may be able to determine the class of troops seen when no other indications are available.

Insignia from the enemy's uniforms, picked up by patrols, often convey valuable information by indicating what troops are in the vicinity.

400. Patrols avoid fighting, except in self-defense or in order to prevent the enemy's patrols from gaining valuable information, or when necessary in order to accomplish their mission. In such cases a patrol fights resolutely even though inferior in numbers.

401. Information gained by patrols is generally of no value unless received in time to be of use to the commander. Patrol leaders must therefore send back information of importance as soon as it is gained, unless the patrol itself is to return at once.

402. If written, messages state the place, date, hour, and minute of their dispatch. The information contained in them is clearly and concisely expressed. They are signed by the patrol leader.

The authorized message book is used, and the form therein adhered to. In pertinent cases, messages are accompanied by a sketch. Where a map reference is necessary, the name of the map is stated.

The source of all information is given. Negative information may be of value.

403. If the message be verbal, the patrol leader requires the messenger to repeat it before starting back. In general, a verbal message covers but one point. Except when there is little chance of error in transmission, messages are written. The messenger must clearly understand where the message is to be delivered and the route to be followed. Verbal messages are subsequently confirmed in writing when practicable.

404. When in friendly territory and not very far from friendly troops, one messenger is sufficient unless the message is very important. In hostile territory, either two men go together, or the message is sent in duplicate by different routes.

405. Whether the information gained is of sufficient importance to be reported at once or may await the return of the patrol is a question which must be decided in each case. In case of reasonable doubt, it is generally better to send the report promptly. If the patrol leader has received proper instructions before starting out and has the requisite ability to lead a patrol, he can generally decide such questions satisfactorily as they arise.

406. Infantry patrols are generally used for work within 2 miles of supporting troops, but cases arise where they must go to greater distances.

For distant patrolling, a mounted patrol under an officer is detailed.

407. For controlling the movements of the patrol, the leader makes use of the arm signals prescribed in these regulations when practicable.

On account of the short distances separating them, members of the patrol ordinarily communicate with each other quietly by word of mouth.

When a member of a patrol is sent to a distant point, communication may be effected by means of simple, prearranged signals. In addition to the signals prescribed in paragraph 43, the following signals should be clearly understood by members of a patrol:

Enemy in sight in small numbers: Hold rifle above head horizontally.

Enemy in force: Same as preceding, raising and lowering the rifle several times.

For communicating with the units from which they are sent out it will often be advantageous to equip patrols with signal projectors.

Mounted Scouts.

408. Mounted scouts should be thoroughly trained in patrolling and reconnaissance. They are used for communication with neighboring troops, for patrolling off the route of march, for march outposts, outpost patrols, combat patrols, reconnaissance ahead of columns, etc. Their further use is, in general, confined to escort and messenger duty. They should be freely used for these purposes, but for these purposes only.

409. When infantry is acting alone, or when the cavalry of a mixed command has been sent to a distance, mounted scouts are of special importance to covering detachments and should be used to make the reconnaissance which would otherwise fall to cavalry.

410. In reconnaissance, scouts should be used in preference to other troops as much as possible. When not needed for mounted duty, they should be employed for neceesary dismounted patrolling.

411. Battalion staff officers should be specially trained in patrolling and reconnaissance work in order that they may be available when a mounted officer's patrol is required.

Sec. V.—MARCH PROTECTION.

General Considerations.

412. A colunm on the march in the vicinity of the enemy is covered by detachments called advance guards, rear guards, or flank guards. The object of these covering detachments is to facilitate the march of the main body and to protect it from surprise or observation.

They facilitate the march of the main body by promptly driving off small bodies of the enemy who seek to harass or delay it, by removing obstacles from the line of march, by repairing roads, bridges etc., thus enabling the main body to progress uninterruptedly in convenient marching formation.

They protect the main body by preventing the enemy from firing into it when in close formation, by holding the enemy and enabling the main body to deploy before coming under the effective fire, by preventing its size and condition from being observed by the enemy, and in retreat, by gaining time for it to make its escape or to reorganize its forces.

When the enemy is encountered on the defensive, to seize a good position and locate his lines, care being taken not to bring on a general engagement unless the advance guard commander is empowered to do so.

413. Tactical unity is respected in making details for covering detachments.

414. The march order of the whole command explains the situation, details the commander and troops for each covering detachment, specifies the route to be taken and the approximate distance to be maintained between the main body and its covering detachments, and directs such reconnaissance as the commander specially desires to have made. When practicable, the front to be covered by reconnaissance is specified.

The order of the commander of a covering detachment clearly explains the situation to subordinates, assigns the troops to the subdivisions, prescribes their approximate distances, and orders such special reconnissance as may be deemed immediately necessary.

An advance or flank-guard commander marches well to the front, and from time to time, orders such additional reconnaissance or makes such changes in his dispositions as the circumstances of the case demand.

Advance Guard of a Large Command.

415. Strength and composition.—Subject to variation according to the situation, one-twentieth to one-third of a command may be assumed as a suitable strength for the advance guard. The larger the force, the larger in proportion is the advance guard, for a large command takes relatively longer to prepare for action than a small one. In large commands it is usually composed of all arms, the proportions depending on the nature of the work, character of the country, etc. In open country it should be strong in field artillery, but artillery is seldom assigned to the advance guard of a command not larger than a brigade. In such cases, however, when there is artillery with a command, an officer of that arm usually accompanies the advance guard for purposes of artillery reconnaissance. In swampy country or jungle it may be formed of infantry alone.

Machine guns materially increase the effectiveness of an advance guard. They are useful in holding bridges, defiles, etc., until reenforcements can be brought up.

Pioneers are usually attached to an advance guard to remove obstacles, repair roads, etc.

The supreme commander generally retains control of the signalmen, and establishes such lines of information as he deems necessary. However, when the nature of the country favors communication by signaling, signalmen may be attached to the advance guard.

An ambulance party usually accompanies large advance guards.

416. Distance from main body.—The distance at which the advance guard precedes the main body, or the main body follows the advance guard, is stated in the march order. In small commands, where there is no difficulty in keeping touch with the main body, the march order generally requires the advance guard to regulate its march on the main body; but where the advance guard is large, or moves at a considerable distance in advance of the main body, the latter regulates its march on the advance guard.

While the distance between these two bodies should be great enough to prevent needless interruptions in the march of the main body, and to give the latter time to deploy should the enemy be encountered, it should never be so great that timely support of the advance guard becomes impracticable.

417. Advance guard commander.—The advance guard commander is responsible for its formation and conduct. Its own security must be effected by proper dispositions and reconnaissance, not by timid or cautious advance. It must advance at normal gait and search aggressively for information of the enemy. Its action when the enemy attempts to block it with a large force depends upon the situation and plans of the commander of the troops.

On receipt of the march order the advance guard commander estimates the situation and, at the proper time, issues the advance guard order. This order divides the advance guard into its tactical components (advance party, support, etc.), and gives the necessary instructions for each.

The advance guard commander is mounted, if practicable, and goes wherever he deems his presence necessary, though his habitual station is at the head of the reserve, or with the support when there is no reserve. He conducts the advance so as not to interrupt the steady march of the main body, and, when ordered to move at a certain distance in front of the latter, maintains the necessary connection therewith. He bears constantly in mind the duties of an advance guard, and studies the ground with a view to tactical dispositions should the enemy be encountered.

418. Distribution of troops.—An advance guard order generally prescribes the following distribution of troops:

Advance party.
Support.
Reserve.

419. The formation of the advance guard must be such that the enemy will be met first by a patrol, then in turn by one or more larger detachments, each capable of holding the enemy until the next in rear has time to deploy before coming under effective fire.

420. The advance party constitutes the reconnoitering element of the support; it is made strong enough to furnish the patrols required for the reconnaissance of the front of the advance,

421. Support.—The support varies in strength from one-fourth to one-half of the advance guard. In mixed commands it consists of infantry, to which pioneers may be attached.

As the support moves out it sends forward an advance party several hundred yards, the distance varying with the terrain and the size of the command.

The advance party reconnoiters to the front and flanks to guard the support against surprise by effective rifle fire. The patrol preceding the advance party on the line of march is called the point, and is commanded by an officer or an experienced petty officer.

If there is no advance cavalry, the advance party, is made stronger (about one-half of the support), and the flanks are guarded, if necessary, by additional patrols sent out from the support and even from the reserve.

The support commander ordinarily marches with the advance party, but goes wherever needed. He sees that the proper road is followed; that guides are left in towns and at crossroads; that necessary repairs are made to roads, bridges, etc., and that information of the enemy or affecting the march is promptly transmitted to the advance guard commander. He endeavors promptly to verify information of the enemy.

The function of the support is in principle the security of the reserve, and the offering of such resistance at various points on the front of the advance as will enable the reserve to deploy for action at points of decisive importance. It is given sufficient strength to carry out its reconnoitering and resisting function.

422. Reserve.—The reserve constitutes the maneuvering and offensive element of the advance guard; it therefore comprises as large a proportion of the advance guard as is consistent with its own security and the preservation of its maneuvering power.

The reserve follows the support at several hundred yards distance. It consists of the remainder of the infantry and pioneers; the artillery, and the ambulance party. The artillery usually marches near the head of the reserve, the pioneers and special troops at the rear.

423. In an advance guard consisting of one battalion, the machine guns, if any, usually form part of the reserve. In an advance guard consisting of two or more battalions, machine guns are assigned to the support and the reserve. Light mortars, one-pounder guns, and accompanying artillery march with the reserve; the pioneer platoon is attached to the support.

424. Connection between the elements of an advance guard is maintained from rear to front, unless otherwise expressly ordered. When the distance between parts of the advance guard or the nature of the country is such as to make direct communication difficult, connecting files march between the subdivisions to keep up communication. Each element of the column sends the necessary connecting files to its front. Cyclists and mounted orderlies may often be advantageously employed for the maintenance of connection.

In supports of a strength equaling or exceeding three companies, a company usually constitutes the advance party. In small supports, it will frequently be advantageous to retain the entire support in one body and send out the point and other patrols directly from it.

425. The distances separating the parts of an advance guard vary according to the mission of the whole force, the size of the advance guard, the proximity and character of the enemy, the nature of the country, etc. They increase as the strength of the main body increases; they are less when operating in rolling, broken country than in open country; when in pursuit of a defeated enemy than against an aggressive foe; when operating against cavalry than when against infantry.

If there be a mounted point, the infantry maintains its gait without reference to it; the mounted point regulates its march on the infantry.

426. To afford protection to an infantry column, the country must be observed on each side of the road as far as the terrain affords positions for effective rifle fire upon the column. In addition to the reconnaissance of the advance party, it will frequently be necessary to send out detached patrols from the support and reserve. If the country that it is necessary to observe be open to view from the road, reconnaissance may not be necessary.

427. The advance guard is responsible for the necessary reconnaissance of the country on both sides of the line of march. Special reconnaissance may be directed by the commander of the troops, or cavalry may be reconnoitering at considerable distances to the front and flanks, but this does not relieve the advance guard from the duty of local reconnaissance.

428. Patrols are sent to the flanks when necessary to reconnoiter a specified locality and rejoin the column and their proper subdivision as soon as practicable.

Where the country is generally open to view, but localities in it might conceal an enemy of some size, reconnaissance is necessary. Where the road is exposed to fire and the view is restricted, a patrol is sent to examine the country in the direction from which the danger threatens. The object may be accomplished by sending patrols to observe from prominent points. When the ground permits and the necessity exists, patrols may be sent to march abreast of the column at distances which permit them to see important features not visible from the road.

Mounted men or cavalry, when available, are used for flank patrols.

429. Cases may arise where the best means of covering the head and flanks of the column will be by a line of skirmishers extending for several hundred yards to both sides of the road, and deployed at intervals of from 10 to 50 yards. A column may thus protect itself when passing through country covered with high corn or similar vegetation. In such case, the vegetation forms a natural protection from rifle beyond very short ranges.

430. Fixed rules for the strength, formation, or conduct of advance guards can not be given. Each case must be treated to meet conditions as they exist. That solution is generally the best which, with the fewest men and unbroken units, amply protects the column and facilitates the advance. When in close contact with the enemy and passing through the zone of his artillery fire, the larger fractions of the advance guard advance in approach formation

431. **Reconnaissance.**—In conducting the reconnaissance the patrols are, as a rule, small—from two to six men. If additional protection is necessary, a flank guard covers the threatened flank. The flanking patrols of the advance party are sent out to examine the country wherever the enemy might be concealed. If the nature of the terrain permits, these patrols march across country or along roads and trails paralleling the march of the column. For infantry patrols and even with those that are mounted, reconnaissance is generally best done by sending the patrols to high places along the line of march to overlook the country and examine the danger points. These patrols report or signal the results of their observations and, unless they have other instructions, join their units by the most practicable routes, other patrols being sent out as the march proceeds and as the nature of the country requires.

Deserters, suspicious characters, and bearers of flags of truce, the latter blindfolded, are taken to the advance guard commander.

Civilians are not permitted to precede the advance guard.

Communications between the fractions of an advance guard and between the advance guard and main body is maintained by wire, messenger service, or signals.

Advance Guard of a Small Command.

432. In forming the advance guard of a command smaller than a brigade, the foregoing distribution is modified, depending upon the situation. A company usually sends forward only a point; a battalion, an advance party; but a battalion at war strength should put a company in the advance guard and a regiment should put a battalion if an enemy is liable to be met. Whenever the advance guard is less than a battalion, there is no reserve.

433. In an advance guard consisting of two battalions or less, the reserve and support, if both are used, are approximately equal; in larger advance guards, the reserve is approximately two-thirds of the whole detachment.

In an advance guard consisting of one battalion, the machine guns, if any, form part of the reserve. In an advance guard consisting of two or more battalions, the machine guns form part of the support.

434. The **support** sends forward an **advance party.** The **advance party**, in turn, sends a patrol, called **a point,** still farther to the front. Patrols are sent out to the flanks when necessary. When the distance between parts of the advance guard or the nature of the country is such as to make direct communication difficult, connecting files march between the subdivisions to keep up communication. Each element of the column sends the necessary connecting files to its front.

435. A battalion acting as an advance guard should be formed about as follows: The **reserve,** two companies; the **support,** two companies; the **advance party,** three to eight squads (about a half company), depending upon the strength of the companies and the reconnaissance to be made; the **point,** a p. o. and three or four men. Or the reserve may be omitted. In such case the advance party will consist of one company preceded by a strong point. The remaining companies form the support.

If there be a mounted point, it should precede the dismounted point by 250 to 600 yards. The advance party may be stronger when there is mounted point in front. The infantry maintains its gait without reference to the mounted point, the latter regulating its march on the former.

436. To afford protection to an infantry column, the country must be observed on each side of the road as far as the terrain affords positions for effective rifle fire upon the column. If the country that it is necessary to observe be open to view from the road, **reconnaissance** is not necessary.

437. Cases may arise where the best means of covering the head and flanks of the column will be by a line of skirmishers extending for several hundred yards to both sides of the road, and deployed at intervals of from 10 to 50 yards. A column may thus protect itself when passing through country covered with high corn or similar vegetation. In such case, the vegetation forms a natural protection from rifle fire beyond very short ranges.

438. Fixed rules for the strength, formation, or conduct of advance guards can not be given. Each case must be treated to meet conditions as they exist. That solution is generally the best which, with the fewest men and unbroken units, amply protects the column and facilitates the advance.

Security for the Head of a Retreating Force.

439. In retreat a column is preceded by a body of troops designated "leading troops," whose principal duty is to clear the road of obstacles and facilitate the withdrawal of the command. The strength and composition of such troops are determined by the situation. Pioneers are generally necessary. If the rear is seriously threatened, the leading troops march practically as an advance guard.

Rear Guards.

440. A **rear guard** is a detachment detailed to protect the main body from attack in rear. In a retreat, it checks pursuit and enables the main body to increase the distance between it and the enemy and to re-form if disorganized.

The general formation is that of an advance guard reversed.

441. The commander takes advantage of every favorable opportunity to delay the pursuers by obstructing the road or by taking up specially favorable positions from which to force the enemy to deploy. In this latter case, care must be taken not to become so closely engaged as to render withdrawal unnecessarily difficult. The position taken is selected with reference to ease of withdrawal and ability to bring the enemy under fire at long range (see pars. 951 and 952).

442. Machine guns and infantry batteries and single guns form a very important part of the rear guard.

443. During a retreat the outpost for the night usually forms the rear guard of the following day.

444. **Strength and composition.**—The strength of a rear guard depends upon the nature of the country and the strength and character of the pursuing force. It can not, like the advance guard, count on the support of the main body.

Machine guns are especially useful in the passage of defiles and in covering the crossings of rivers.

Pioneers and ambulance parties may be assigned to rear guards.

The troops of a rear guard are selected from those that have had previous successes, or have suffered little loss and are comparatively fresh.

446. **Distribution of troops.**—The proximity and conduct of the enemy control, to a large extent, the formation of a rear guard. When it is not necessary to withdraw in deployed lines, the greater part of the rear guard marches on the road in column of route, taking up a formation resembling that of an advance guard faced to the rear. The distribution of troops is therefore similar to that of an advance guard, namely:

Reserve.
Support.

The support, as in an advance guard, is divided into two parts; that part nearest the enemy is called the rear party and marches with the rear point. Pioneers may accompany the support or be attached to the rear party. The reserve is composed mainly of infantry and artillery.

447. **Distances.**—The distances of the rear guard from the main body and between the fractions of the rear guard are about the same as in the case of an advance guard. If marching at night, the rear guard draws nearer the main body.

Rear Guard of an Advancing Force.

448. If there is a possibility that the rear of the column may be attacked, a rear guard of suitable strength and composition is provided. Its conduct is practically the same as that of the rear guard of a retreating force. It generally marches in rear of the trains, those organizations following the combatant troops without distance.

Flank Guards.

449. The flanks of a column are protected in part by the advance guard, which carefully examines the ground on both sides of the line of march. It may be necessary, however, to provide additional security for a flank threatened by the enemy. This is done by sending a detachment, called a flank guard, to cover the exposed flank.

450. A flank guard is a detachment detailed to cover the flank of a column marching past, or across the front of, the enemy. It may be placed in position to protect the passage, or it may be so marched as to cover the passage.

451. The object of the flank guard is to hold the enemy in check long enough to enable the main body to pass, or like the advance guard, to enable the main body to deploy.

Like all other covering detachments, it is made no stronger than is necessary; it is detailed only when special flank protection is required.

452. Practicable communication must exist between the flank guard and the main body.

453. The flank guard is marched in the same manner as a separate command; that is, with advance or rear guards or both, as circumstances demand, and with patrolling on the exposed flank.

454. At times it may be necessary for an advance-guard commander to send out large reconnoitering parties which temporarily assume the character and duties of a flank guard. Such parties are given specific orders as to when and where they are to rejoin the column.

455. Flank marches.—When the main body executes a flank march near the enemy, the flank guard becomes a body of great importance. If the flank march is due to a considerable change of direction in the march of the column, it is generally advisable to convert the advance guard into a flank guard, and detail a new advance guard to precede the column. If the troops making a flank march start from camp, a separate flank guard will have to be provided.

In long columns the large units, such as regiments, will provide their own flank observation.

Provost Guard.

456. A **provost guard** is formed by the commanding officer where one is deemed necessary. It is commanded by **a provost marshal,** under whose orders the guard acts.

457. The duty of the provost guard is to enforce all police regu-tions adjacent to a camp or marching column. They protect the habitants of the country from pillage and violence and prevent xcesses of all kinds; keep all roads clear; arrest all enlisted men and ivilian employees absent without proper authority from their or-anizations; arrest all marauders, and collect all stragglers and hand hem over to their organizations.

They keep a list and description of all camp retainers and followers nd watch their conduct.

They police all railroad stations, public houses, depots, and public uildings, protect telegraph and telephone lines and railways from amage; keep hostile inhabitants in order, carry out their disarma-nent and prevent spying.

458. In cases of emergency the provost guard may call on any roops to assist them. All persons belonging to the military service re required to give every assistance to the provost guard in the xecution of their duties.

459. Officers and enlisted men *when actually performing the duty* f provost guards should wear a blue brassard on the left arm half ay between the elbow and shoulder bearing the letters "**M. P.**" n white. (Army designation for military police.)

460. As a rule, provost guards on duty will not be reprimanded r placed in arrest except by the superiors under whose command hey happen to be. Members of the provost guard when not on uty, that is, when not wearing the blue brassard, have no special rivileges.

461. The provost guard is detailed ordinarily as a complete organ-zation, such as a company, or battalion.

462. The activities of a provost guard are restricted normally to zone immediately adjacent to the camp or bivouac of the troops to hich they are attached, or on the march, to the rear of the column.

When the entire theater of operations is similarly safeguarded by roops on detached duty, with special duties as above defined, hey are known as **military police.**

CHAPTER III.

MARCHES AND CAMPS.

Sec. I.—MARCHES.

General Principles.

463. A successful march, whether in peace or war, is one that places the troops at their destination at the proper moment and in the best possible condition. In war, marches are of daily occurrence, and success depends in a great measure upon the skill with which they are conducted.

Good marching is secured by careful preparation, strict discipline, and the due observance of march sanitation. (See "Military Hygiene.")

While conforming to other requirements, marches are conducted so as to reduce to a minimum the hardships of the troops.

Troops are informed of the length of halts so that they can take full advantage of the same.

The men are not kept under arms longer than necessary, nor required to carry heavy burdens when transportation is available.

Special care is paid to the feet of the men and the fitting of socks and shoes and to the hoofs and backs of animals.

In prolonged marches at least one day in seven should be a day of rest.

A forced march is never undertaken unless the situation requires it.

The conduct of a march (forming the column or columns, distribution of troops, the start, rate, length of march, etc.) is controlled by the situation and object to be accomplished.

The marching efficiency of a unit is judged by the amount of straggling and elongation, and the condition of men and animals at the end of the march.

Preparation.

464. Warning orders are issued at the earliest practicable moment order that preparations may be made thoroughly and without aste.

465. It is the duty of the commander to see that the necessary reparations are made; that the men and animals are in fit condition nd that they are properly equipped; that all trains accompanying e command are loaded as prescribed; that proper measures have een inaugurated for the replenishment of supplies; and that the ecessary arrangements have been made for the care and evacuation the sick and wounded.

466. The training of infantry should consist of systematic exercises develop general physique and of actual marching to accustom en to the fatigue of bearing arms and equipment and to train them observance of the rules of march discipline.

467. With new or untrained troops, the process of hardening the en must be gradual. Immediately after muster into the service, e physical exercises and marching are begun. Ten-minute periods vigorous setting-up exercises should be given three times a day loosen and develop the muscles. One march should be made ach day with full equipment, beginning with a distance of 2 or 3 iles and increasing the distance daily as the troops become hardned, until a full day's march under full equipment may be made ithout exhaustion.

468. A long march should not be made with untrained troops. a long distance must be covered in a few days, the first march ould be short, the length being increased each succeeding day.

469. Except for urgent reasons, marches should not begin before an our after daylight, but if the distance to be covered necessitates ither breaking camp before daylight or making camp after dark, is better to do the former.

470. The position of companies in the battalion and of battalion the regiment is ordinarily changed daily so that each in turn ads.

471. Special attention should be paid to the rate of march. It is reater for trained than for untrained troops; for small commands han for larger ones; for lightly burdened than for heavily burdened roops. It is greater during cool than during hot weather.

472. In large commands the marching capacity of troops is greatly educed by faulty march orders and poor march discipline.

The halts and starts of the units of a column should be regulate by the watch and be simultaneous.

Closing up during a halt, or changing gait to gain or lose distanc should be prohibited.

473. Each company and platoon commander inspects his un before the commencement of the march and assures himself th arms and equipment are as prescribed, canteens filled, pack properly made up, supplies to be transported on wagons complet properly marked, and prepared for transportation, etc. Con manders of units with transportation inspect the loading of wagon adjustment of harness, etc. As far as practicable, fatigue and oth details that will be required at the end of the march (digging latrin and refuse pits, pitching officers' tents, kitchen details, etc.) ar made before the commencement of the march.

474. Forming the column.—To form the column for a march th commander issues the necessary orders (march order). (See Ar 592 et seq.)

The march order states the object of the march, gives the di tribution of the troops, order of march of the main body, manner forming the column, etc. If the command consists of two or mo columns, the order of the supreme commander generally indicat the march to be made by each column, and the column commande issue corresponding march orders.

The method of forming the column depends upon the size of th units, the location of their camps or quarters, and the tactic situation.

When troops are encamped or bivouacked at some distance fro the road, columns of the size of a regiment and larger columns ar formed by successive arrival at, or clearing of, an initial or startin point by subordinate units. The initial point, as a rule, is locate in the direction of the proposed march. The commander fixes th initial point after considering the position of the troops and the road by which they can join the column. He also prescribes the hou at which the leading fraction or fractions clear the initial point, an if necessary, the routes to be followed in reaching it. To preven needless marching, he may designate special initial points for part of the command.

As a general rule, the larger units of a command should be campe in the order in which they will march on the following day.

In drafting march orders, the road space and rate of march of th different fractions of the command and their distances from the initia point must be considered. With troops marching four abreast artillery and trains in single column of carriages, the following may be assumed for approximate calculations: Two men per yard for foot troops, one man per yard for each mounted man, 20 yards for each gun, caisson, or wagon, 12 yards for each auto truck, and 8 yards for carts.

Commanders of subordinate units examine the route to be followed, calculate the time required, and start their commands in such manner that there will be neither delay or unnecessary waiting under arms either at the initial point or elsewhere.

They may designate initial points for their own commands. In every case the initial point should be of easy access.

When troops are located on or near the roads to be followed, the commander prescribes the hour of starting for the larger units; the subordinate commanders issue corresponding orders for their commands.

475. When commands camp in column along the route of march, they may be assembled in march column prior to the commencement of the march. Assembly or massing of the command prior to the commencement of the march may also be made necessary by uncertainty in the tactical situation when marches are conducted in proximity to the enemy.

Where several elements of a command, marching by different routes, are to unite on a single route or when their march routes cross each other, arrival at or clearing of road junction should be so timed as to prevent collision between columns.

The order of regiments in brigades, battalions in regiments, and companies in battalions is generally changed from day to day; the leading unit on any day forms at the tail on the following day.

When troops are to march to an assigned camping or billeting area, the location of the several elements of the command in the area should be considered in forming the columns.

476. Night marches are difficult, slow, and exhausting. Concealment of movement and other tactical considerations will, however, frequently require such marches (see Night operations).

The different units of the column, including those of the train, are separated at the start by distances prescribed in these regulations (Figs. 135, 136, and 137) or by the commander. These distances are temporarily increased or diminished, according to circumstances, thus facilitating uniform progress without checks and with a continual tendency to the gradual resumption of normal distances.

Sec. II.—CONDUCT OF THE MARCH.

477. On the march, troops keep to the right of the road, as far as practicable leaving the left free. Even when the roads are narrow, space should be left for messengers to pass freely along the column. When roads are soft with mud or heavy with sand or very dusty, it may be advisable to divide the column longitudinally so as to permit men and animals to pick their way; the middle of the road is kept clear. Care should be taken to prevent straggling or undue lengthening of the column.

478. The habitual march formation is column of squads.

On wide roads the march may be conducted in double column of squads when necessary; on narrow roads or trails in column of twos or files. In marching across country the commander adopts the most advantageous formation.

The elements of the column cover accurately in file and keep accurately dressed toward the side of the guide. Rifles are carried either slung vertically or in such a manner on the shoulder, muzzle up and elevated, as not to interfere with the soldier next in rear.

Cavalry marches in column of fours on good roads or when compact formation is desirable, otherwise in column of twos; artillery in single column of carriages or in double column if the width of the road permits.

As a rule, troops on the march pay no compliments; individuals out of ranks salute when they address, or are addressed by, a superior officer. The march is habitually at route step.

479. File closers, including officers, form additional ranks at the head and rear of the units. No one is permitted to march habitually outside of the column, which must at all times be orderly and compact.

480. An officer of each company marches at its rear in order to keep it closed up and prevent straggling.

No person is permitted to fall out without specific authority of an officer of his company. Authority is given only for the most urgent reasons. Men who fall out on account of sickness are given a written permit to be presented to the surgeon, who disposes of the case according to the necessity and notifies the company commander of the action taken.

481. Sanitary troops with combat equipment from the regimental sanitary detachment are attached to each battalion and march at the tail of the battalion. Disabled men falling out are examined, tagged, and treated, and sent back to the proper transportation or otherwise disposed of as their condition requires.

The camp infirmary attached to the regiment from the divisional sanitary train marches at the tail of the regiment. On arrival in camp the infirmary serves as a camp dispensary and as a collecting point for the evacuation of casualties.

482. In addition to the driver only one other person is permitted to ride on a field wagon. All other personnel with the regimental trains are formed and marched in one group, under the senior present, at the tail of each battalion transportation group. All men who accompany the field trains wear their full equipment, less the pack. The latter may be carried on the train.

Sec. III.—RATE AND LENGTH OF MARCHES.

483. The rate of march varies with the length of the march, size of the command, condition and training of the troops, and other circumstances; sandy, rough, muddy, or slippery roads, great heat and dust, strong headwinds, and broken country reduce the rate. If hills are to be climbed or swampy country is to be crossed or defiles passed, liberal allowances are made in time calculations.

The rate prescribed for drill is 100 yards a minute or 3.4 miles an hour; on the road, the maximum to be counted on is 88 yards a minute or 3 miles an hour; including halts this rate is equivalent to 2½ to 2¾ miles per hour. The rate of infantry columns, under average conditions, may be assumed at 2¼ to 2½ miles an hour.

The average march of infantry is 15 miles a day; but in extensive operations, involving large bodies of troops, the average is about 12 miles a day. Small commands of seasoned troops, marching on good roads in cool weather, can average 20 miles a day.

The rate of a wagon train varies with the class and condition of the draft animals, the load the length of the column, and the condition of the roads. While large mules drawing light loads on good roads can cover nearly 4 miles an hour, a rate of 2 miles, including halts, is all that can be expected in long columns even under favorable conditions; small trains may make 2½ miles an hour. The daily march of a wagon train is about the same as that of infantry.

The rate of march is regulated by the commander of the leading company of each regiment, or, if the organizations are separated by greater than normal distances, by the commander of the leading unit of the organization. A uniform rate should be maintained.

The officer setting the pace constantly checks the cadence of his stride (which has been previously measured by marching over a measured course) against the watch, in order to regulate the march rate.

A forced march is never undertaken unless the situation requires it. As a rule, forced marches are made by increasing the number of marching hours rather than by accelerating the rate.

The rate of a wagon train varies with the class and condition of the draft animals, the load, length of the column, and the condition of the roads. While large mules drawing light loads on good roads can cover nearly 4 miles an hour, in long columns a rate of 2 miles, including halts, is all that can be expected even under favorable conditions; small trains may make 2½ miles an hour. The daily march of a wagon train is about the same as that of infantry.

The average load of a pack mule is 250 pounds, and a train thus loaded can travel from 20 to 25 miles a day on ordinary roads or trails; over rough country, from 10 to 15 miles.

The rate of march, the load, and the distance that may be covered in a day with autotrucks or with tractors drawing wagons are dependent on the character and condition of the roads and the carrying or pulling power of the trucks or tractors.

484. The start.—When practicable, marches begin in the morning, ample time being allowed for the men to breakfast, animals to feed, and the wagons or animals to be packed. The time for reveille should be designated the evening before. Canteens are filled, fires put out, latrines covered, and the camp policed before departure.

The signals for striking camp and putting the command in march are ordered by the commanders of the larger units at the proper time. One or more officers of each organization superintend the preparations for the march.

The different units of the column, including those of the train, are separated at the start by distances prescribed in regulations or by the commander. These distances are temporarily increased or diminished, according to circumstances, thus facilitating uniform progress without checks, and with a continual tendency to the gradual resumption of normal distances.

485. Halts.—To rest the men and animals and for other purposes, a command on the march is occasionally halted. The first halt is made after marching about three-quarters of an hour, and is about 15 minutes long, to enable the men to attend to the calls of nature and to adjust their clothing, etc. Judgment should be exercised in selecting the place for the first halt; it should not be made in a village or place where one of the objects of the halt would be defeated.

After the first rest, there is for foot troops a halt of about 10 minutes every hour—that is, the troops march 50 minutes and then halt 10. In very hot weather the halts may be longer and more frequent. The men are allowed to fall out, but remain in the immediate vicinity of their places.

As a rule, troops prefer to finish a day's march as soon as possible. In good weather, with favorable temperature, long halts are not desirable on marches of less than 15 miles for infantry or 25 miles for mounted men. When the day's march will run well into the afternoon, a halt of about one hour near meal time is advantageous. Places for long halts should be selected with care; wood, water, grass, dry ground, and shade are desirable features. Arms are stacked and equipments removed; mounted troops dismount and loosen cinches.

In hot weather, especially in the tropics, it may be desirable to avoid the midday heat. If the march is long, the command may make an earlier start, or it may rest for three or four hours during the hottest part of the day and finish the march in the evening. As a general proposition, however, it is undesirable to arrive at a strange place after nightfall or even late in the afternoon.

Halts are not made in or near towns or villages unless to procure water or supplies, and when so made, the men remain in column, details being sent for whatever is necessary.

Halts may be made pursuant to signal or at hours specified by the c. o. of the troops (e. g., hourly halts, to be made uniformly at 10 minutes before the hour). In the latter case, all units halt and resume the march at the time specified.

486. Distribution of troops.—The order of march of a column is controlled mainly (1) by tactical considerations, which are paramount in the presence of the enemy, and (2) by the rule requiring the hardships of troops to be reduced to a minimum. (See Art. 412 et seq.)

The order of march of the main body is determined by the contemplated employment of the troops. When contact with the enemy is probable, columns are closed up and march on broad fronts; communication is maintained between the columns on parallel roads, and all impedimenta not necessary in the conflict are kept in the rear. If a part of a unit of infantry is assigned to the advance guard, the remainder of that unit usually marches at the head of the main body.

During the advance, the artillery, in order to expedite its entry into action, is generally near the head of the main body, sufficient infantry leading to insure proper security. Its commander usually accompanies the commander of the column. If there is danger to the flanks from small bodies of the enemy, the artillery may be broken into columns not longer than a regiment; it then marches like a convoy with infantry in front, in or opposite the center, and at the rear. This formation of necessity delays the entry into action of a part of the infantry; to reduce this delay, the artillery marches, if possible, in double column, and its combat train follows immediately in rear of the last infantry unit. When moving into action the artillery has the right of way.

During an advance the order of march of a column is generally as follows:

1. **Advance guard.**
   (a) Infantry with machine guns.
   (b) Pioneer detail.
   (c) Artillery detachment (if required).
   (d) Ambulance party.
2. **Main body.**
   (e) Infantry (battalion or regiment).
   (f) Machine guns (if separately organized).
   (g) Artillery (less advance guard detachment).
   (h) Infantry (less battalion or regiment mentioned in (e)).
   (i) Pioneers (less advance guard detachment).
   (j) Ambulance party (less advance guard detachment).
   (k) Ammunition train.
   (l) Supply train.
   (m) Provost guard.
3. **Rear guard** (when required).

487. During a retreat the order of march is practically the reverse of the above.

A detachment of pioneers usually marches near the head of each column to repair roads, strengthen bridges, etc.

On marches through long defiles, or dense forests, or on night marches, it may be advisable to place the artillery near the rear of the column.

488. Trains.—Military trains are at all times provided with the necessary guards. Field trains are guarded as far as practicable by men on duty with the train, by convalescents and other noneffectives, and by dismounted men. In marches into action the trains are held far enough in rear not to interfere with the movements of troops or to check withdrawal in case of defeat.

If a wagon breaks down or is stalled, its load is transferred to other wagons and the road cleared as soon as practicable.

Stream Crossings, Defiles, and Obstacles.

489. When a cause of delay—for example, a damaged bridge—is encountered, the troops in rear are notified of the minimum length of the delay; they then conduct themselves as at regular halts.

In ascending or descending slopes, crossing streams or other obstacles, or passing through defiles requiring a reduction of front, every precaution is taken to prevent interruption of the march of the troops in rear. If the distances are not sufficient to prevent check, units are allowed to overlap; if necessary, streams are crossed at two or more places at the same time; in passing through short defiles the pace is accelerated and the exit cleared at once. If a company is delayed while crossing an obstacle, the head of the company slackens the pace or halts a short distance beyond the crossing until all of the company has passed and has closed up; it then regains its distance, increasing the pace if necessary.

Careful examination is made of fords, boggy places, bridges of doubtful character, ice, etc., before attempting a crossing.

When necessary, an officer is designated to superintend the crossing; his instructions must be strictly observed, the troops crossing in the formation prescribed by him. Troops crossing bridges march without cadence.

Whenever a military bridge is constructed with the bridge equipage, or if deemed necessary, in cases where improvised material is employed, a bridge-guard officer will be detailed for its care and maintenance during the period of its use. All orders, regulations, and instructions issued by this officer will be considered as emanating from the commander of the force crossing the bridge.

When roads lead through swamps or quicksand or across streams with treacherous bottoms, their limits are marked with stakes or bushes, or warnings are placed at dangerous points. At night, lanterns are hung from the stakes, and a fire is built or a lantern hung to mark the landing.

When the current is strong and the water deep, foot troops cross on as broad a front as possible, the men marching abreast and holding hands. They should not look at the water but at the opposite shore.

Fords that are at all difficult delay long columns, unless the troops cross at several places at once. The crossing of many animals or wagons may deepen a ford and render it impassable; new places may thus become necessary.

The men enter pontons or barges singly at the bow or stern, and gradually move toward the stern or bow; larger vessels may be entered in column of twos; the men retain the places assigned them so as not to interfere with the handling of the boat; in small boats when the water is rough, they sit down; when there is danger of capsizing, they are directed to remove equipments.

Horses are loaded one at a time. When there is room for a single row only, they alternate heads and tails; if in two rows, they face inward. If a horse falls into the water, it is turned loose.

Wagons are generally loaded by hand; if practicable, the teams are sent on the same vessel.

Unloading is also from the bow, in good order, without crowding; men sitting down do not rise before their turn.

When rafts are used, special precautions are necessary. The center of the raft is first occupied and then the load uniformly distributed. Unloading is carried out in inverse order, the center of the load being last to leave.

Care of Troops.

490. On the march, commanders of the larger units keep themselves informed of the condition of their commands and of the progress of subordinate units in rear.

Sources of water supply are examined by experts and marked good or bad. In countries infected with cholera or other harmful bacteria, this examination is imperative.

The drinking of any other beverage than potable water on the march is prohibited. Thirst should be quenched before starting by frequent small sips of water. On a march of ordinary length, the use of water should be limited to rinsing the mouth or the consumption of small amounts if the exertion is considerable or weather conditions require it. The drinking of water is often a matter of habit; under ordinary conditions, a canteen of water should last a day's march. Soldiers should be trained to be economical in the use of water and to keep a small supply until their canteens can be replenished.

Commanders afford the men ample opportunity for replenishing their canteens, but this is done by order, not by straggling from the command. In certain cases, the inhabitants may be required to place water in vessels along the line of march for the convenient use of troops. A reserve supply of water for use in emergencies is carried on water carts or wagons. On long marches through country deficient in water or where the water is bad, special measures for the organization of the water supply will be necessary.

Rations or lunches are not consumed until permission is given by the company commander.

Animals of wagon trains are watered while in camp—before departure and after arrival—or during a long halt. If time permits, they may be watered on the march from buckets or by unhitching and riding or leading to water.

One of the greatest sources of hardship on a march, especially for infantry, is hot weather. Every precaution is taken to prevent suffering from this cause. Halting places are selected when practicable where there is shade and free circulation of air, and the men are cautioned against drinking too much water. Green leaves or moist handkerchief in the hat afford relief from the hot rays of the sun. If the men are overheated, care is taken to prevent them being chilled by exposure to cold winds or drafts.

Abraded and blistered feet should be promptly dressed. At the end of each march, company commanders will, when practicable, require that feet be bathed and dressed and footgear changed.

491. Forced marches.—The conduct of forced marches is controlled by the distance to be covered and the time in which the march is to be accomplished. As they seriously impair the fighting power of even the best troops, forced marches are undertaken only in cases of necessity. Long forced marches can not be made without injury unless the command is in good condition and the march is made with good judgment. The difficulties of the problem rapidly increase with the size of the command and the length of the march, but in any case the completion of the march should find the troops in condition to accomplish the object of the march.

With foot troops forced marches are generally made by increasing the number of marching hours, the halts and periods for cooking and sleep being arranged so as to afford the maximum benefit. The rules prescribed for the average march are followed as closely as possible. For large columns of infantry, marching long distances, increase of pace is seldom of value.

A maximum day's march for infantry and trains is about 28 to 30 miles. A march of this character can not, as a rule, be prolonged more than 36 hours. If a forced march is to continue for several days, it becomes practically a succession of daily marches of more than average length.

Foot troops are favored in every way possible. They are assigned the best roads, and not intermingled with vehicles or mounted men. If transportation is available, their packs are lightened.

492. Night marches.—Night marches are sometimes made in hot weather; generally however, they are made as the result of a forced march to surprise the enemy or to secure a favorable position from which he may be attacked at night or at dawn.

Moonlight and good roads are favorable for night marches. A waning moon is of advantage in marches beginning early in the morning. As all-night marches rapidly impair the efficiency of a command a few hours' rest should be taken, if practicable. Special effort is necessary to maintain good march discipline.

Precaution is taken that the proper road is followed and that contact between units is maintained, men being stationed to mark changes of direction. If necessary, guides are secured and charged with the duty of following the right road. When, due to unfavorable conditions, units can not be kept well closed, men will be placed at forks and crossings of roads, especially on dark nights and at times of dense fogs or storms, and always when passing through cities or towns from which roads diverge in many directions.

When the march is secret, additional precautions are necessary. Silence is maintained; mouthpieces of bugles are removed, and articles of equipment secured to prevent rattling; smoking is not permitted; villages and farmhouses are avoided on account of warning given by dogs. If the troops are compelled to leave the roads, their progress will be slow, and additional time allowance must be made.

Sec. IV.—CAMPS, BIVOUACS, AND CANTONMENTS.

493. Camp or bivouac.—As a command approaches the camping place the commander issues the halt order. This order provides for the outpost, if necessary, and gives instruction for the encampment of the command.

494. When troops are sheltered under canvas, they are in **camp.** When resting on the ground without shelter, they are in **bivouac.** When occupying buildings in towns or villages, or huts specially erected, they are in **cantonments.**

Cantonments often develop through improvement of camps—huts or temporary buildings taking the place of tents. During a prolonged suspension of hostilities, the occupation of enemy territory, and at sieges, cantonments are advantageous, especially in cold or wet weather.

Billeting is the assignment of troops to public or private buildings for quarters.

The Selection of Camp Sites.

495. In campaign, tactical necessity may leave little choice in the selection of camp sites, but under any conditions, the requirements of sanitation should be given every consideration consistent with the tactical situation.

496. In general, the following principles govern the selection of camp sites:

The site should be convenient to an abundant supply of pure water.

Good roads should lead to the camp. Interior communication throughout the camp should be easy.

Wood, grass, forage, and supplies should be at hand or easily obtainable.

The area should accommodate the command without crowding and without compelling the troops of one unit to pass through the area of another.

The site should be sufficiently high and rolling to drain off storm water readily, and if the season be hot, to catch the breeze. In cold weather, it should preferably have a southern exposure with woods to the north to break the cold winds. In warm weather, an eastern exposure, on ground moderately shaded by trees, is desirable.

The site should be dry. For this reason, porous soil, covered with stout turf and underlaid by a sandy or gravelly subsoil, is best. A site on clay soil or where the ground water approaches the surface is damp, cold, and unhealthful.

Alluvial soils, marshy ground, and ground near the base of hills, or near thick woods or dense vegetation, are undesirable as camp sites on account of dampness. Ravines and depressions are likely to be unduly warm and to have insufficient or undesirable air currents.

Proximity to marshes or stagnant water is undesirable on account of the dampness, mosquitoes, and the diseases which the latter transmit. The high banks of lakes or large streams often make desirable camp sites.

Dry beds of streams should be avoided; they are subject to sudden freshet.

497. The occupation of old camp sites is dangerous, since they are often permeated by elements of disease which persist for considerable periods. Camp sites must be changed promptly when

there is evidence of soil pollution or when epidemic disease threatens, but the need for frequent changes on this account may be a reflection on the sanitary administration of the camp.

498. Form and dimensions of camps.—The forms of the camp should be such as to facilitate the prompt encampment of troops after a march and their prompt departure when camp is broken. The form of camps will depend upon the tactical situation and the amount and nature of ground available. In certain cases, particularly in one-night halts in the presence of the enemy, camps must of necessity be contracted, while in other cases, where a more extended halt is contemplated and where tactical reasons will permit, better camp sanitation may be secured, and a more comfortable arrangement made by the expansion of camp areas.

The figure gives the general form, dimensions, and interior arrangements of a regimental camp where the area of available ground is ample.

Under similar favorable conditions, the brigade may camp in column or in line of columns. In the latter formation the interval between regiments should be about 50 yards. When the camp site has a restricted area, intervals and distances are reduced.

Under service conditions, camp sites that will permit the encampment of regiments and brigades as above indicated will not often be available and regularity must be sacrificed.

499. Establishing the camp.—Camp is established pursuant to the halt order. This order provides for the outpost, if necessary, and gives instructions for the encampment of the main body. When practicable, large commands are encamped by brigades.

The camping ground may be selected by the supreme commander, but in large commands is generally chosen by a staff officer sent forward for that purpose. This officer, with a representative from each regiment and a medical officer, precedes the command, selects the camping ground, assigns sections thereof to the larger fractions of the command, and causes them to be conducted to their respective sections on arrival. He also designates the place for obtaining drinking and cooking water, for watering animals, for bathing, and for washing clothing, in the order named, from upstream down. (See Military Hygiene.)

On the arrival of the troops, guards are posted to enforce proper use of the water supply; the interior camp guards proceed to their places, and after posting sentinels, pitch their tents. The remaining troops pitch tents and secure animals and equipment; kitchens are established and details made to procure fuel, water, forage, etc., 38.8 ACRES

Fig. 4.

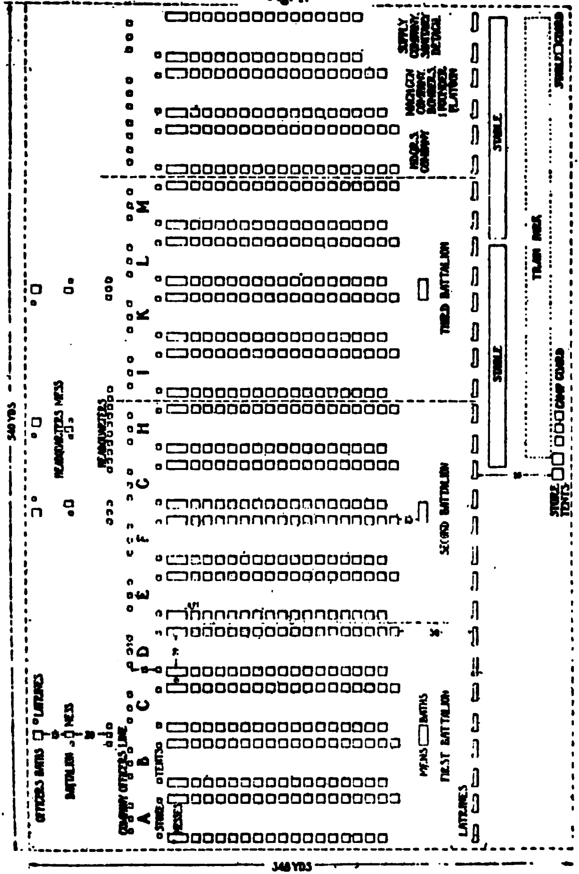

FIG. 4—Camp of a regiment of infantry. War strength.

and to prepare latrines (sinks) and kitchen pits (see Military Hygiene); if necessary, tents, company streets, and picket lines are ditched.

In the presence of the enemy, places of assembly for the troops are designated and directions given for their conduct in case of attack. Lines of information are established with the outpost.

500. Bivouacs.—On marches or in the presence of the enemy troops are frequently forced to bivouac on account of lack of suitable ground or for tactical reasons. On the other hand, in fine weather, in midsummer, or in the dry season in the tropics, the troops may bivouac from choice.

From the tactical point of view, bivouacs are very convenient, but for sanitary reasons they are resorted to, as a rule, only when necessary. The general principles governing the selection of camp sites apply to bivouacs. The ground should be dry and protected against sun and wind. Light woods are nearly always good sites for infantry bivouacs, on account of the shelter and material available.

In the artillery on marches from day to day the men may be permitted to sleep under carriages or paulins covering the harness, thus obviating the necessity of pitching tents.

Shelter During Battle.

501. During a lull in an engagement, or when hostilities are suspended for the night, the troops bivouac in line of battle on or near the position they occupy, the officers in rear of the center of their units. Reserves required to remain in instant readiness generally bivouac in column with a flank to the front. After the outposts are established, the commander of the main body decides whether the troops shall use their shelter tents or not.

Sec. V.—BILLETING.

Preparations.

502. Arrangements for sheltering troops should, as far as practicable, be made before their arrival. The preparations for quartering a command are made by means of quartering parties. Quartering parties are sent out not only by troops changing station but also when practicable by troops on the march, whether they are to be sheltered in billets or in camp.

503. The duties of quartering parties are:

To select the billeting area when this has not been already definitely determined and make arrangements for its occupancy with he proper authorities;

To apportion the billeting area among the subordinate units of he command, and allot to each the available facilities for its administration and supply;

To reserve facilities for the general service of administration, supply, and command (interior guards, headquarters, infirmaries, etc.);

In special cases to secure supplies;

In general, to take the necessary measures to insure that all agencies of command, administration, and supply continue functioning with the least possible interruption after the arrival of the command.

504. The basis of the apportionment is the quartering capacity of the town or area obtained from the town major, the local authorities, or by other means, and the strength of each unit in officers, men, animals, and vehicles furnished by the command.

Billets are allotted by the assignment of sections of the town to units. Subordinate units reallot subsections, streets, or houses to their component units. Companies allotted to a street should occupy both sides of the street.

Each section should have easily recognizable boundaries.

When tactical considerations are controlling, the distribution of the troops must be made with regard to combat. Machine-gun companies and 1-pounder and light-mortar units should be near their carts on the side of the town opposite to the enemy.

Units with animals and transportation are billeted or camped near watering places and places suitable for the parking of wagons.

In arranging camps, bivouacs, or billets, battalions, companies, platoons, and squads will be kept together in order to facilitate control.

The minimum floor space required for each man in billets is 6¾ feet by 2½ feet. Wherever space permits, each man should have 40 square feet of floor space. When space in buildings is insufficient for billeting the entire command, a portion of the command may be camped or bivouacked in gardens, public squares, etc., or outside of the town (close billets).

505. The composition of a quartering party will vary, depending on the time and transportation available, and whether the command is on the march in campaign or changing station or billeting area.

506. A quartering party of a regiment on the march will comprise:

A line or tactical staff officer (quartering officer);

A supply officer;
A medical officer;
Battalion c. p. o. or other representative from each battalion;
Mess p. o. and supply p. o. of each company.

When practicable, the quartering party will include the officer of the day, a detail of the guard, and two men of each company for fatigue.

Motor cycles, bicycles, or mounts should, when necessary, be supplied to members of the quartering party.

A quartering party of a battalion acting alone or in a detached area is similarly constituted.

The quartering officer commands the quartering party. When several units are to occupy the same area, the senior quartering officer is in command of all parties.

The quartering officer places the quartering party in charge of the senior soldier present and directs it to proceed to a designated point in or near the quartering area. Accompained by the supply officer, medical officer, and several soldiers, he then proceeds to the quartering area. On arriving in the quartering area he arranges with the town major, the local officials, or private parties for the necessary areas, shelters, or supplies. He allots areas, sections, or districts to the battalions, the machine-gun company, headquarters company, and supply company and reserves suitable accomodations or locations for regimental headquarters, the guard, and the infirmary. He locates an assembly place for the regiment (usually outside of the town or on the side of the camp toward the enemy) and designates water sources for men, animals, and bathing. He requires the medical officer to determine and report upon the sanitary conditions of the area and its water supply. He placards contaminated water sources and forbidden areas, arranges for traffic control, police regulation, and prevention of fires. On arrival of the guard detail, he posts a guard for the proper security and control of the area (sentries over water sources, at village exits, etc.).

Battalion c. p. o.'s select from the area or district allotted to them suitable accommodations for battalion headquarters and staff, locate if necessary a battalion assembly place, and distribute the battalion area to the companies. Supply p. o.'s representing companies determine the capacity of shelters and subdivide the area among the platoons, reserving a proper place for company headquarters, officers' quarters, kitchens, stables, and latrines, select a company assembly place, and placard the company area so as to show all assignments. The mess p. o. secures the necessary supplies.

In the case where camps are to be established, the location of the different units and their officers' quarters, kitchens, picket lines, and latrines is established in accordance with the plan fixed by the quartering officer (fig. 4).

After the quartering officer has completed his dispositions, he rejoins the command, accompanied by the medical officer, and reports to the commanding officer of the troops. Battalion and company quartering parties remain in the quartering area, and when necessary and practicable, send a soldier to their organization commanders to serve as a guide.

On arriving in the quartering area, companies are marched to their assembly places, and before being marched to their quarters the men are instructed as to the location of the company assembly place, company headquarters, and the regimental or battalion infirmary, and as to messing arrangements, time of next assembly, service calls, and the local orders and regulations in force. Details for guard, fatigue, etc., are published and the sick are formed and sent to the infirmary for treatment.

When the command is to be sheltered in billets, the companies should be held at their assembly places until all billeting arrangements are completed. Each platoon leader then marches off his platoon; before dismissal, he informs his men as to the location of his own quarters and those of the c. c., and as to the hour when men are to be permitted to leave the platoon area, assigns squads to their shelters, makes arrangements for lighting, preparations for extinction of fire, digging of latrines, placing of urinal buckets, etc. He inspects his area, requires it to be properly policed, and orders the necessary cleaning of arms and equipment.

507. When in close proximity to the enemy and troops must be disposed in camp or bivouac in accordance with tactical requirements, the reconnaissance of the camp site and the distribution of units must be made by the commanding officer of troops.

Administration.

508. When troops of different organizations are sheltered in the same town or camp, the senior line officer is the town or camp commander.

The camp or town commander regulates interior and exterior guard service, traffic control, police control of soldiers and, in hostile territory, of the inhabitants, the readiness of the command for action, and if a town major has not been assigned to the town, the distribution of quarters to incoming units, and all relations with the civil authorities. The town commander may designate an acting town major when a permanent town major has not been assigned to the town.

509. The duties of the acting town major will vary widely, depending on the length of occupancy of the billeting area by the command and on whether the area is in friendly or hostile territory. Duties which may be assigned to him include:

The conduct of all transactions between the troops and the civil authorities and inhabitants;

The keeping of a complete and accurate list of all accommodations, showing for each building or premises the capacity in officers, men, offices, storerooms, animals, and other needs to be anticipated;

The assignment of accommodations to incoming troops and preparation of a supply of rough maps for their use.

Location and maintenance of suitable latrines, baths, water, washing and incinerating facilities;

Arrangements for the disposal of refuse, fire protection, and traffic regulation;

Establishment of necessary direction signs at all points where they will be of service;

Marking of buildings and premises as to capacity and use;

In hostile territory, police surveillance of the inhabitants, counter-espionage measures, etc.

In regiments and larger units, a senior officer may be assigned to this duty and charged with supervision of the service of interior guards and other security measures.

510. In each camp and occupied town, an officer of the day is detailed. He reports to the camp or town commander for orders, or to the acting town major when the guard is under the latter's orders. He is in command of all interior guards and is responsible for the execution of the necessary security measures, police regulations, and standing orders.

In each battalion one officer, in each company one p. o., are detailed to remain constantly on duty in the battalion or company. Immediately after their arrival in camp or cantonment, they report for instructions to the officer of the day. They are responsible for the maintenance of order and the execution of all regulations or orders given by the camp or town commander or the commander of their unit. They communicate all instructions received to their organization commanders at the first opportunity.

511. An interior guard is established in each camp and occupied village. Sentries should be posted at village exits, over picket lines, and wagon parks. Each unit furnishes the sentries required within its own section or area; such sentries constitute part of the camp or town guard and are posted under its direction. The establishment of exterior guards (outguards, provost guards) may also be necessary.

The conduct of interior guards is governed by the provisions of the manual of guard duty.

Special security measures are necessary in the case of occupied towns in hostile territory (stronger guards, patrolling in and in the vicinity of the town, guarding bridges, searching houses for telephone installations, holding of hostages, quartering of men in assembled units, closing of exits to all except military traffic, etc.).

512. When commands are billeted in towns, special precautions for the prevention of fire should be taken (provision for buckets filled with water, regulation of cooks' fires, etc.). The use of lights must be restricted and controlled, especially where there is danger of aerial bombardment.

513. When quartered in the theater of active operations, each unit must be in such state of readiness for action that it can prepare to move on the shortest possible notice. Men sleep fully dressed, arms and equipment close at hand. On the sounding of the call to arms, assembly or fire call, units assemble at their prescribed assembly places, and proceed to the assembly place of the next higher unit or to other specially designated points.

Assembly places should be so located that units or members thereof do not cross each other's path in assembling.

514. Under circumstances where hostile aerial bombardment may be expected, concealment and dispersion of the camp in order to avoid or minimize its effects are necessary. Concealment can best be secured by camping in wooded areas; measures must be taken to prevent betraying the location of the camp through the formation of paths or trails. In permanent or semipermanent camps or cantonments, partial protection against the effects of aerial bombardment is secured by the construction of embankments around huts or tents, by sinking the floors below the ground level, or by excavating lengths of zigzag trench to be occupied in case of alarm. Lookouts are posted to give warning of the approach of hostile aircraft, and provision made for sounding the alert. Troops at drill, when necessary, establish lookouts for the same purpose.

During concentrations prior to and during operations, troops and transportation in billets must be kept under cover from aerial observation during daylight hours.

515. The quarters of the camp or town commander should be so located that they can be easily found; at night, they should be marked by a shaded lantern. All sentries should be instructed as to the location of the commander's quarters so that messengers can be directed to it. Placards showing the name of the town and unit occupying it and the direction of routes should be posted at town exits.

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If the stream be small, the water supply may be increased by building a dam. Small springs may be dug out and lined with a gabion, a barrel or box with both ends removed, or with stones; the space between the lining and the earth is filled with puddled clay. A rim of clay is built around the spring to keep out surface drainage. The same method may be used in constructing small reservoirs near the borders of swamps, streams, or lakes for the purpose of increasing or clarifying the water supply.

517. Water that is not known to be pure should be purified by use of the water bag and the chemicals furnished. If these are not available, it may be boiled 20 minutes, then cooled.

518. Arrangements are made for men to draw water from the authorized receptacles by means of a spigot or other similar means. The dipping of water from the receptacles or the use of a common drinking cup is prohibited.

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519. Camp kettles can be hung on a support consisting of a green pole lying in the crotches of two upright posts.

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with stones, clay, etc. A flue is [illegible] kettles. The trench should [illegible] The draft can be improved [illegible] etc., at the leeward end of the flue.

Four such trenches [illegible] will give one flue for use [illegible]

A slight slope of the flue [illegible] drainage and improves the [illegible]

520. A lack of portable [illegible] of stone and covered with earth [illegible] available, an oven may be [illegible] with one head out on its side [illegible] of six or more inches and then [illegible] thickness. A clay flue is [illegible] barrel, which is then burned [illegible] baked clay covering for the oven.

An oven can be similarly [illegible] wood, supported on a horizontal [illegible] covered and burnt out as in the [illegible]

An oven may be constructed by [illegible]

To bake with ovens of the type [illegible] and then close flues and ends.

521. Food must be protected from [illegible] must be provided for cleaning and [illegible] the men. Kitchens and the ground [illegible] scrupulously clean.

522. Solid refuse should be promptly [illegible] in the kitchen fire or in an improvised [illegible] removal by scavengers.

523. In temporary camps, if the soil is [illegible] the kitchens may be strained through [illegible] pits dug near the kitchen. Flies [illegible] Boards or poles, covered with brush or [illegible] may be used to cover the pits. The [illegible] tected from flies. Pits of this kind, dug [illegible] operate successfully. When troops camp [illegible] only, shallow kitchen sinks should be [illegible] ual, the men should be required to [illegible] flank of the camp or bivouac.

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Disposal of Excreta.

524. Immediately on arrival in camp, bivouac, or billets, sinks should be dug. This is a matter of fundamental sanitary importance, since the most serious epidemics of camp diseases are spread from human excreta, by carriage of elements of disease from them by flies, or by the pollution of the water supply through drainage into it.

Sinks are usually provided for each company on the basis of one seat to each ten men, two linear feet of trench length per seat. One sink, with seats in the same proportion, is provided for the officers of each battalion. Those for men are invariably located on the side of camp opposite the kitchens. All latrines should be at least 100 yards from any kitchen. They should be so placed that they can not pollute water supply or camp site as a result of drainage or overflow. For this purpose, their location and their distance from camp may be varied.

Open pits are dangerous during the fly season. The danger may be greatly reduced by requiring each individual to cover his excreta with earth or by a thorough daily burning of the entire area of the trench. Combustible sweepings or straw, saturated with oil, may be used for this purpose. When filled to within two feet of the top sinks should be discontinued, filled in, mounded up, and marked by a proper sign.

525. For long halts, or when camp is made for a single night, straddle trenches 15 inches deep, 8 to 10 inches wide, and 24 inches long, in the proportion of one to each ten men, will suffice.

In camps of longer duration, the trenches should be 2 feet wide, at least 6 feet deep, and of sufficient length to provide the proper ratio of seats to persons using them. They should be provided with a pole for a seat and a back rest and should be screened with brush or canvas.

When boards are obtainable, either a fly-proof trench cover with squatting-holes and lids or conventional box seats with hinged, falling lids should be provided.

Urinal troughs, discharging into the trenches, should be provided.

In permanent camps or billets, urinal tubs will be placed in company streets at night and removed at reveille. Their location should be plainly marked, and the tubs should be thoroughly and frequently disinfected.

Sec. VI.—CARE OF TROOPS.

526. Lack of sufficient rest renders troops unfit for hard work and diminishes their power of resisting disease. Therefore commanders should secure for the troops, whenever possible, their accustomed rest.

The rules of sanitation are enforced. (See "Military Hygiene.")

Men should not lie on damp ground. In temporary camps and in bivouac they raise their beds, if suitable material, such as straw, leaves, or boughs, can be obtained, or use their ponchos or slickers. In cold weather and when fuel is plentiful the ground may be warmed by fires, the men making their beds after raking away the ashes.

When troops are to remain in camp for some time all underbrush is cleared away and the camp made as comfortable as possible. Watering troughs, shelter in cold weather, and shade in hot, are provided for the animals, if practicable.

In camps of some duration guard and other routine duties follow closely the custom in garrison. The watering, feeding, and grooming of animals take place at regular hours and under the supervision of officers.

The camp is policed daily after breakfast and all refuse matter burned.

Tent walls are raised and the bedding and clothing aired daily, weather permitting.

Arms and personal equipments are kept in the tents of the men. Horse equipments and harness are placed on the tongues of the wagons and covered with paulins.

The water supply is carefully guarded. When several commands are encamped along the same stream this matter is regulated by the senior officer.

If the stream is small, the water supply may be increased by building dams. Small springs may be dug out and lined with stone, brick, or empty barrels. Surface drainage is kept off by a curb of clay.

General Remarks.

527. As soon as the lines of company streets are established, the positions of the tents should be marked from the flank nearest the officers tents by pins. The right (left) front corner of the wall and common tent, and the door pins of the conical wall tents occupy the points so marked. The distance between pins may be determined by pacing, or by a light cord with the distances marked upon it. These distances are: For wall tents, 8 paces; common tents, 6 paces; conical wall tents, 10 paces; and pyramidal tents, 12 paces. The pins marking the position of the tents are, when practicable, set on a straight line, and the company officers verify and correct the alignment of such pins in the quickest and most convenient manner. (See Art. 352 et seq.)

Wall pins are so driven as to slope slightly away from the tent; guy-pins, so as to slope slightly toward the tent.

Each tent, its fly, hood, poles, and tripod should have the same number.

Working Parties.

528. On arriving at the ground selected for the camp the following parties should be told off, each in charge of a p. o., and their duties assigned by the c. c.: (1) Sink party; (2) water party; (3) ration party; (4) wood party.

Sec. VII.—DAILY ROUTINE IN CAMP.

Roll Calls.

529. There should be, daily, at least three roll calls, viz, at reveille, retreat, and tatto. They will be made on the company parades by the c. p. os., superintended by an officer of the company.

At all established roll calls, except dress parade, after the companies are dismissed, each officer superintending the company roll call reports to the bn. adj., or other officer designated, the result of the roll call; the bn. adj. or other officer designated reports the result of the roll call to the rg. adj.

Immediately after reveille roll call, the tents or quarters and the space around them will be put in order by the men of the companies, superintended by the p. os., and the guardhouse or guard tent by the guard or prisoners.

Daily, before 8 a. m., c. cs. will sign and forward the morning reports of their respective companies to the bn. c. These reports will be consolidated by the bn. adj. for the information of the bn. c., who will sign and forward a copy to the rg. c. Similarly the battalion reports will be consolidated by the rg. adj. for the information of the rg. c., who will sign and forward a copy to the bg. c. or senior officer present.

Routine Calls.

530. The commanding officer establishes the hours for the different calls, having regard to the season and circumstances. (See Art. 2060 et seq.)

1. **Reveille** is usually sounded about sunrise.
2. **Breakfast call** should be sounded as soon after reveille as practicable, allowing the men time to wash themselves and put their tents or quarters in order. Usually no work or drill will be ordered before breakfast.
3. **Sick call** in time to allow the company c. p. os. to obtain from the surgeon a list of the men they are to report as sick on their morning reports.
4. **Fatigue** is the signal for policing camp or quarters, and for working parties to commence work.
5. **Chief petty officers' call** is the signal for the morning reports to be sent to the battalion headquarters.
6. **First call** is the first signal for formation for roll call and for all ceremonies except guard mounting.
7. **Guard mounting** is the first signal for guard mounting, which, when held in the morning, usually follows morning parade.
8. **Assembly** is the signal for companies or details to fall in on the company parades.
9. **Drill call** is usually sounded after the morning fatigue duties have been performed, or after dinner.
10. **Recall from drill** is the signal for the drill to cease.
11. **Dinner call**, usually at noon.
12. **Retreat** at sunset, when troops may be paraded under arms, weather permitting; orders and details for the following day are published then.
13. **Supper call** generally follows parade.
14. **Tattoo** not earlier than 9 nor later than 10.30 p. m.
15. **Taps** from 15 to 30 minutes after tattoo.
16. **To arms** is the signal for the men to fall in, under arms, on their company parade grounds, as quickly as possible.
17. **The general** is the signal to break camp and prepare to march.

531. Distinguishing flags and lanterns.

Distinguishing.	Day.	Night.
Headquarters (brigade).....	The flag, or senior officer's pennant according to the rank of the bg. c.[1]	Three white lanterns.
Regimental commanders...	None [1]......................	Two white lanterns.
Battalion commanders......	...do[1]........................	One white lantern.
Guard tents...................	Guard flag..................	One red lantern.
Hospitals......................	Hospital flag...............	One green lantern.

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[1] Brigade, regimental, and battalion office tents should be marked with appropriate sign boards. Companies should be similarly designated with sign boards, giving the company number or ship designation.

Sec. VIII.—TENT PITCHING.

Shelter Tents.

532. Being in single or double column of platoons, the captain commands: **FORM FOR SHELTER TENTS.**

The soldiers of company and platoon headquarters form additional files on one or both flanks of the platoons, as directed by company and platoon commanders; blank files are filled by file closers or by men taken from the front rank.

533. The c. c. then causes the company to take intervals as described in the School of the Squad, and commands: **PITCH TENTS.**

At the command pitch tents, each man steps off obliquely to the right with the right foot and lays his rifle on the ground, the butt of the rifle near the toe of the right foot, muzzle to the front, barrel to the left, and steps back into his place; each front-rank man then draws his bayonet and sticks it in the ground by the outside of the right heel.

Equipments are unslung, packs opened, shelter half, poles and pins removed; each man then spreads his shelter half, triangle to the rear, flat upon the ground the tent is to occupy, the rear-rank man's half on the right. The halves are then buttoned together. Each front-rank man joins his pole, inserts the top in the eyes of the halves, and holds the pole upright beside the bayonet placed in the ground; his rear-rank man, using the pins in front, pins down the front corners of the tent on the line of bayonets, stretching the canvas taut; he then inserts a pin in the eye of the guy rope and drives the pin at such distance in front of the pole as to hold the rope taut. Both then go to the rear of the tent; the rear-rank man adjusts the pole and the front-rank man drives the pins. The rest of the pins are then driven by both men, the rear-rank man working on the right.

As soon as the tent is pitched, each man arranges his equipment and the contents of his pack in the tent and stands at attention in front of his own half on line with the front guy-rope pin.

To have a uniform slope when the tents are pitched, the guy ropes should all be of the same length.

534. To pitch double shelter tents, the commands are the same as prescribed above except that half intervals (2 paces) are taken at the command **Take half interval**, and tents are pitched at the command **Pitch double tents**. Only the odd numbers of the front rank mark the line with the bayonet.

The tent is formed by buttoning together the square ends of two single tents. Two complete tents, except one pole, are used to form a double tent. Two guy ropes are used at each end; the guy pins are placed in front of the corner pins.

The tents are pitched by Nos. 1 and 2, and by No. 3 and 4, front and rear rank.

All men spread their shelter halves on the ground the tent is to occupy. The halves of front-rank men are placed with the triangular ends to the front. All four halves are then buttoned together, first the ridges and then the square ends. The front corners of the tent are pinned by the front-rank men; the odd number holds the poles, the even number drives the pins. The rear-rank men similarly pin the rear corners.

While the odd numbers steady the poles, the even number of the front rank takes his pole and enters the tent; assisted by the even number of the rear rank, he adjusts the pole to the center eyes of the shelter halves in the following order: (1) the lower half of front tent; (2) the lower half of the rear tent; (3) the upper half of the front tent; (4) the upper half of the rear tent. The guy ropes are then adjusted.

The tents having been pitched, the triangular ends are turned back, contents of the rolls arranged, and the men stand at attention, each opposite his own shelter half and facing outward.

535. When the pack is not carried, the company is formed for shelter tents, intervals are taken, arms are laid aside or on the ground,

the men are dismissed and proceed to the wagon, secure their packs return to their places, and pitch tents as heretofore described.

To Strike Shelter Tents.

536. The men standing in front of their tents: **STRIKE TENTS.** Equipments and rifles are removed from the tent; the tents ar lowered, packs made up, and equipments slung, and the men stand at attention in the places originally occupied after taking intervals.

Single Sleeping Bag.

537. Spread the poncho on the ground, buttoned end at the feet, buttoned side to the left; fold the blanket once across its short dimension and lay it on the poncho, folded side along the right side of the poncho; tie the blanket together along the left side by means of the tapes provided; fold the left half of the poncho over the blanket and button it together along the side and bottom.

Double Sleeping Bag.

538. Spread one poncho on the ground, buttoned end at the feet, buttoned side to the left; spread the blankets on top of the poncho; tie the edges of the blankets together with the tapes provided; spread a second poncho on top of the blankets, buttoned end at the feet, buttoned side to the right; button the two ponchos together along both sides and across the end.

Common and Wall Tents.

539. To pitch all types of service tents, except shelter and conical wall tents: Mark the line of tents by driving a wall pin on the spot to be occupied by the right (or left) corner of each tent. For pyramidal tents, the interval between adjacent pins should be about 30 feet, which gives a passage of two feet between tents. If the tripod is used, spread it on the ground where the center of tent is to be. Spread the tent on the ground to be occupied, door to the front, and place the right (or left) front wall loop over the pin. The door (or doors, if more than one) being fastened and held together at the bottom, the left (or right) corner wall loop is carried to the left (or right) as far as it will go and a wall pin driven through it, the pin being placed in line with the right (or left) corner pins already driven. At the same time, the rear corner wall loops are pulled to the rear and outward, so that the rear wall of the tent is stretched to complete the rectangle. Wall pins are then driven through these loops. Each corner pin should be directly in rear of the corresponding front corner pin, forming a rectangle. Unless the canvas is wet, a small amount of slack should be allowed before the corner pins are driven. According to the size of the tent, one or two men, crawling under the tent if necessary, fit each pole or ridge or upright into the ring or ridge pole holes, and such accessories as hood, fly, and brace ropes are adjusted. If a tripod be used, an additional man goes under the tent to adjust it. The tent, steadied by the remaining men, one at each corner guy rope, is then raised. If the tent is a ward or storage type, corner poles are next placed at the four corners. The four corner guy ropes are then placed over the lower notches of the large pins which are driven in prolongation of the diagonals at such distance as to hold the walls and ends of the tent vertical and smooth when the guy ropes are drawn taut. A wall pin is then driven through each remaining wall loop, and a large pin for each guy rope is driven in line with the corner guy pins already driven. The guy ropes of the tent are placed over the lower notches of the pins, while the guy ropes of the fly are placed over the upper notches, and are then drawn taut. Brace ropes, when used, are then secured to stakes or pins suitably placed.

Conical Wall Tent.

540. Drive the door pin and center pin, 8 feet 3 inches apart Using the hood lines with the center pin as center, describe two concentric circles with radii, 8 feet 3 inches, and 11 feet 3 inches. In the outer circle, drive two door guy pins, 3 feet apart. At intervals of about 3 feet, drive the other guy pins.

In other respects, conical tents are erected practically as in the case of pyramidal tents.

To Strike Common, Wall, Pyramidal, and Conical Wall Tents.

541. **STRIKE TENTS.**

The men first remove all pins except those of the four corner guy ropes or (conical wall tent) the four quadrant guy ropes. The pins are neatly piled or placed in a receptacle.

One man holds each guy, and when the ground is clear, the tent is lowered and folded, or rolled and tied, the poles, or the tripod and pole, fastened together, and the remaining pins collected.

To Fold Tents.

542. In folding common, wall, hospital, and storage tents: Spread the tent flat on the ground, folded at the ridge so that bottoms of side walls are even, ends of tent forming triangles to the right and left; fold the triangular ends of the tent in toward the middle, making it rectangular in shape; fold the top over about 9 inches; fold the tent in two by carrying the top fold over clear to the foot; fold again in two from the top to the foot; throw all guys on the tent except the second from each end; fold the ends in so as to cover about two-thirds of the second cloths; fold the left end over to meet the turned-in edge of the right end, then fold the right end over the top, completing the bundle; tie with the two exposed guys.

Method of Folding Pyramidal Tent.

The tent is thrown toward the rear, and the back wall and roof canvas pulled out smooth. This may be most easily accomplished by leaving the rear-corner wall pins in the ground with the wall loops attached, one man at each rear-corner guy and one holding the square iron in a perpendicular position and pulling the canvas to its limit away from the former front of the tent. This leaves the three remaining sides of the tent on top of the rear side, with the door side in the middle.

Next carry the right-front corner over and lay it on the left-rear corner. Pull all canvass smooth, throw guys toward the square iron, and pull the bottom edges even. Then take the right-front corner and return to the right, covering the right-rear corner. This folds the right side of the tent on itself, with the crease in the middle and under the front side of tent.

Next carry the left-front corner to the right and back as described above; this when completed will leave the front and rear sides of the tent lying smooth and flat and the two side walls folded inward, each on itself.

Place the hood in the square iron which has been folded downward toward the bottom of tent, and continue to fold around the square iron as a core, pressing all folds down flat and smooth, and parallel with the bottom of the tent. If each fold is compactly made and the canvass kept smooth, the last fold will exactly cover the lower edge of the canvas. Lay all exposed guys along the folded canvas except the two on the center width, which should be pulled out and away from bottom edge to their extreme length for tying.

Then, beginning at one end fold toward the center on the first seam (the one joining the first and second widths), and fold again toward the center so that the already folded canvas will come to within about 3 inches of the middle width. Then fold over to the opposite edge of middle width of canvas. Then begin folding from opposite end, folding the first width in half, then making a second fold to come within about 4 or 5 inches of the part of the tent already folded, turn this fold entirely over that part. Take the exposed guys and draw them taut across each other, turn bundle over on the under guy, cross guys on top of bundle, drawing them tight. Turn bundle over on the crossed guys, and tie lengthwise.

When properly tied and pressed together, the package thus made will be 11 by 23 by 34 inches, requiring about 8,855 cubic inches to store or pack.

Stencil the unit designation on the lower half of the middle width of canvas in the back wall.

CHAPTER IV.

COMBAT.

Sec. I.—GENERAL.

543. These regulations deal with the principles of tactical employment of infantry units and of auxiliary arms and special units placed under the orders of infantry commanders for combat. In regard to the latter, only so much is included as relates to the tactical dispositions which infantry commanders must make to coordinate the action of attached auxiliary arms and special units with that of the infantry.

544. The engagement of numerically superior forces does not in itself insure victory. Discipline, leadership, skill in use of weapons and ground, and above all superior resolution are the conditions essential to success.

545. Modern combat demands the highest order of training, discipline, leadership, and morale on the part of the infantry. Complicated maneuvers are impracticable; efficient leadership and a determination to win by simple and direct methods must be depended upon for success.

546. The duties of infantry are many and difficult. All infantry must be fit to cope with all conditions that may arise. Modern war requires but one kind of infantry—good infantry.

547. The infantry must have the tenacity to hold every advantage gained, the individual and collective discipline and skill needed to master the enemy's fire, and the determination to close with the enemy in attack; and to meet him with the bayonet in defense. Infantry must be trained to bear the heaviest burdens and losses, both of combat and march. Good infantry can defeat an enemy greatly superior in numbers, but lacking in training, discipline, leadership, and morale.

548. It is impossible to establish fixed forms or to give general instructions that will cover all cases. Officers and petty officers must be so trained that they can apply suitable means and methods to each case as it arises. Study and practice are necessary to acquire proper facility in this respect. Theoretical instruction can not replace practical instruction; the former supplies correct ideas and gives to practical work an interest, purpose, and definiteness not otherwise obtainable.

549. After the mechanism of extended order drill has been learned with precision in the platoon, every exercise should be, as far as practicable, in the nature of a maneuver (combat exercise) against an imaginary, outlined, or represented enemy.

Platoon extended-order drill may be conducted without reference to a tactical situation, but a combat exercise, whatever may be the size of the unit employed, should be conducted under an assumed tactical situation.

550. An effective method of conducting a combat exercise is to outline the enemy with a few men equipped with flags. The umpire or inspector states the situation, and the commander leads his troops with due regard to the assumptions made.

Changes in the situation, the results of reconnaissance, the character of artillery fire, etc., are made known to the commander when necessary by the umpire or inspector, who, in order to observe and influence the conduct of the exercise, remains in rear of the firing line. From this position he indicates, with the aid of prearranged signals, the character of the fire and movements of the hostile infantry. The signals are intended for the men outlining the enemy. These men repeat the signals; all officers and men engaged in the exercise and in sight of the outlined enemy are thus informed of the enemy's action, and the exercise in conducted accordingly.

Assistant umpires, about one for each platoon in the first line, may assist in indicating hostile fire and movements and in observing the conduct of the exercise.

An outlined enemy may be made to attack or defend.

Situations should be simple and natural. During or after the exercise, the umpire or inspector should call attention to any improper movements or incorrect methods of execution. He will prohibit all movements of troops or individuals that would be impossible if the enemy were real. The slow progress of events to be expected on the battle field can hardly be simulated but the umpire or inspector will prevent undue haste and will attempt to enforce a reasonably slow rate of progress.

The same exercise should not be repeated over the same ground and under the same situation. Such repetitions lead to the adoption of a fixed mode of attack or defense and develop mere drill masters. Fixed or prearranged systems are prohibited.

Sec. II.—OFFENSIVE COMBAT.

General Principles.

551. The infantry must take the offensive to gain decisive results. Both sides are therefore likely to attempt it, though not necessarily at the same time or in the same part of a long battle line.

In the local combats which make up the general battle, the better endurance, use of ground, fire efficiency, discipline, and training will win. It is the duty of the infantry to win the local successes which enable the commanding general to win the battle.

552. An infantry that knows how to attack will know how to defend, because it is easier to defend than to attack. While training in the duties of covering detachments and in defensive measures generally will not be neglected, such training must not be emphasized at the expense of the more important combat training. All training should aim at developing positive qualities of character and action rather than encouraging negative traits. The basis of training will be the attack.

553. The infantry attack has as its basis the fighting spirit and aggressiveness of officers and petty officers with fearless, intelligent leading on their part, and the individual initiative of the private soldier himself. It is the special duty of all leaders to stimulate and cultivate these qualities and to develop discipline and self-confidence, individual vigor, and fighting capacity, in order to establish and maintain the moral value of the infantry.

554. The primary duties of infantry commanders in combat are to maintain direction on their objectives, establish and maintain contact with the units on their flanks, and keep the higher command informed as to the situation. The posts of commanders and their message centers should be chosen with reference to these requirements.

Before entering an action the commander should be as far to the front as practicable, in order that he may personally see the situation, order the deployment, and begin the action strictly in accordance with his own wishes.

During the action he must, as a rule, leave to the local leaders the detailed conduct of the assaulting troops, posting himself either with his reserve or in such a position that he is in constant, direct, and easy communication with it.

When their troops are victorious, all commanders should press forward to clinch the advantage gained and to use their reserves to the best advantage.

555. There is no situation which can justify a commander for remaining in ignorance of the situation on his front. The necessity for communication with the rear must not so tie him to a fixed post as to prevent him from keeping in touch with the situation by personal reconnaissance or from exercising his direct personal influence on the troops in action. The requirements of intercommunication should be met by a properly organized report and message center which, during the absence of the commander, is under charge of an officer competent to carry into effect the orders of superior authority.

556. Infantry has two general methods of action: **fire** and **movement.**

Fire must be used to cover all movement in the presence of the enemy, not masked by cover, darkness, or fog.

Movement has as its object the gaining of such a position relative to the enemy as will permit of the development of a fire superior to that of the enemy, either by virtue of its direction (flanking or from the rear) or its volume (enveloping action).

557. The movement of units in the advance to the attack should be by **bounds,** i. e., successive positions along the axis of movement are selected as intermediate objectives and reconnoitered prior to occupation. The objects of the advance by bounds are:

(1) To preserve the direction of the advance.

(2) To gain possession of the points of the terrain which will constitute supporting points for a further advance.

(3) To locate positions affording cover and determine the most suitable routes of advance thereto.

558. **Surprise** is an essential element of a successful attack. In small, as well as large operations, the effect of surprise should constantly be striven for. This effect is attained by concealment of the place or time of attack, coupled with rapidity of maneuver. Concealment of the point of attack permits the offense to concentrate superior forces and gain the time required for the prosecution of a sustained offensive before its action can be countered by a hostile concentration. Concealment of the time of attack favors the moral

effect which is the essence of all offensive action and prevents the defense from taking timely counter measures.

559. The effect of surprise must be reinforced and exploited by **fire superiority.** The advance can dispense with fire protection only when covered by darkness, fog, or smoke.

560. The success of any operation undertaken by a unit depends in a large measure on the degree to which subordinate units lend each other mutual support. While for the purposes of the orderly development of an operation, it is necessary to assign zones of action to units, such assignment must in no sense be construed as preventing them from operating outside the limits of such zones for the purpose of supporting the action of adjacent units when this can be done without abandoning their primary mission and the tactical situation requires it.

The principle of mutual support is of special application to units in support and reserve which have not yet been committed to action.

561. The critical points of a hostile defensive system are in general those points which afford extended observation, either over the defensive zone and its rear, or the ground over which the attack must advance; and those points which control the communications of the defensive zone (road centers, villages). Such points are the especially important objectives of the attack.

562. When officers and men belonging to fighting troops leave their proper places to carry back, or to care for, wounded during the progress of the action, they are guilty of skulking. This offense must be repressed with the utmost vigor.

Sec. III.—LEADERSHIP.

General Considerations.

563. The art of leadership consists in applying sound tactical principles to concrete cases on the battle field.

Self-reliance, initiative, aggressiveness, and a conception of teamwork are the fundamental characteristics of successful leadership.

564. A correct grasp of the situation and a definite plan of action form the soundest basis for a successful combat.

A good plan once adopted and put into execution should not be abandoned unless it becomes clear that it can not succeed. Afterthoughts are dangerous, except as they aid in the execution of details in the original plan.

565. Combats that do not promise success or some real advantage to the general issue should be avoided; they cause unnecessary losses, impair the morale of one's own troops, and raise that of the enemy.

566. Complicated maneuvers are not likely to succeed in war. All plans and the methods adopted for carrying them into effect must be simple and direct.

Order and cohesion must be maintained within the units if success is to be expected.

567. Officers must show themselves to be true leaders. They must act in accordance with the spirit of their orders and must require of their troops the strictest discipline on the field of battle.

568. The best results are obtained when leaders know the capacity and traits of those whom they command; hence in making detachments units should not be broken up, and a deployment that would cause an intermingling of the larger units in the firing line should be avoided.

569. Leading is difficult when troops are deployed. A high degree of training and discipline and the use of close-order formations to the fullest extent possible are therefore required.

570. In order to lighten the severe physical strain inseparable from infantry service in campaign, constant efforts must be made to spare the troops unnecessary hardship and fatigue; but when necessity arises, the limit of endurance must be exacted.

571. The complete equipment is carried into action unless the weather or the physical condition of the men renders such measure a severe hardship. In any event, only the pack[1] will be laid aside. The determination of this question rests with the regimental commander. The complete equipment affords to men lying prone considerable protection against shrapnel.

572. A commander takes full and direct charge of his firing line only when the line has absorbed his whole command.

573. The latitude allowed to officers is in direct proportion to the size of their commands. Each should see to the general execution of his task, leaving to the proper subordinates the supervision of details, and interfering only when mistakes are made that threaten to seriously prejudice the general plan.

Teamwork.

574. The comparatively wide fronts of deployed units increase the difficulties of control. Subordinates must therefore be given great latitude in the execution of their tasks. The success of the

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[1] The "pack" includes blanket, poncho, clothing, and shelter tent.

whole depends largely upon how well each subordinate coordinates his work with the general plan.

A great responsibility is necessarily thrown upon subordinates, but responsibility stimulates the right kind of an officer.

575. In a given situation it is far better **to do any intelligent thing** consistent with the aggressive execution of the general plan, than to search hesitatingly for the ideal. This is the true rule of conduct for subordinates who are required to act upon their own initiative.

A subordinate who is reasonably sure that his intended action is such as would be ordered by the commander, were the latter present and in possession of the facts, has enough encouragement to go ahead confidently. He must possess the loyalty to carry out the plans of his superior and the keenness to recognize and to seize opportunities to further the general plan.

576. Independence must not become license. Regardless of the number of subordinates who are apparently supreme in their own restricted spheres, there is but one battle and but one supreme will to which all must conform.

Every subordinate must therefore work for the general result. He does all in his power to insure cooperation between the subdivisions under his command. He transmits important information to adjoining units or to superiors in rear, and, with the assistance of information received, keeps himself and his subordinates duly posted as to the situation.

577. When circumstances render it impracticable to consult the authority issuing an order, officers should not hesitate to vary from such order when it is clearly based upon an incorrect view of the situation, is impossible of execution, or has been rendered impracticable on account of changes which have occurred since its promulgation. In the application of this rule the responsibility for mistakes rests upon the subordinate, but unwillingness to assume responsibility on proper occasions is inductive of weakness.

Superiors should be careful not to censure an apparent disobedience where the act was done in the proper spirit and to advance the general plan.

578. When the men of two or more units intermingle in the firing line, all officers and men submit at once to the senior. Officers and platoon guides seek to fill vacancies caused by casualties. Each seizes any opportunity to exercise the functions consistent with his grade, and all assist in the maintenance of order and control.

Every lull in the action should be utilized for as complete restoration of order in the firing line as the ground or other conditions permit.

579. Any officer or p. o. who becomes separated from his proper unit and can not rejoin must at once place himself and his command at the disposal of the nearest higher commander.

Anyone having completed an assigned task must seek to rejoin his proper command. Failing in this, he should join the nearest troops engaged with the enemy.

580. Men are taught the necessity of remaining with their companies, but those who become detached must join the nearest company and serve with it until the battle is over or reorganization is ordered.

Sec. IV.—COMBAT PRINCIPLES.

581. Combat is divided into two general classes, the **offensive** and the **defensive**. The defensive is divided into the purely passive defense and the temporary defense, which has for its object the assumption of the offensive at the first favorable opportunity.

Decisive results are obtained only by the offensive. Aggressiveness wins battles. The purely passive defense is adopted only when the mission can be fully accomplished by this method of warfare. In all other cases, if a force be obliged by uncontrollable circumstances to adopt the defensive, it must be considered as a temporary expedient, and a change to the offensive with all or part of the forces will be made as soon as conditions warrant such change.

582. Irrespective of other considerations, successful operations in the field depend:

1. Upon a concrete, definite, and well-advised plan of action; and,
2. Upon a proper communication of this plan to the subordinates who must assist in carrying it out.

The first of these involves a proper estimate of the situation, having due regard to the tactical situation and the forces available and opposing; the second involves the issue of formal field orders, to adequately convey the plan to the various units concerned. The larger the forces and the greater the distribution of the command, the more necessary is it that such plan and such orders be well conceived and clearly expressed.

Plan of Action.

583. The estimate of the situation and the resulting plan of action are based upon the information of the enemy and of the terrain obtained by reconnaissance and, as far as time will permit, upon the study of the terrain in the field of probable operations, by the leader himself. The leader then carefully considers, from his own viewpoint, all the circumstances affecting the particular problem.

In making his estimate he considers his mission as set forth in the orders or instructions under which he is acting, or as deduced by him from his knowledge of the situation, all available information of the enemy (strength, position, movements, probable intentions, etc.), conditions affecting his own command (strength, position, supporting troops, etc.), and the terrain in so far as it affects the particular military situation. He also considers the relative efficiency of the troops on both sides, and the probable results of victory or defeat. He then compares the various plans of action open to him and decides upon the one that will best enable him to accomplish his mission.

In doubtful cases aggressiveness and initiative will usually win. To take up a defensive position, to withdraw, or to change the direction of march so as to avoid contact with the enemy may be a conservative or prudent course to follow in doubtful cases, but such a course will not bring victory nor shorten the campaign. The mission of an army in war is to win battles. Every step taken must be with that end in view.

Clear and decisive orders are the logical result of definite and sure decisions and are the means of transforming the decision into action.

Combat Orders.

584. The initial combat orders of the brigade are almost invariably written; those of the regiment are generally so. The written order is preferable and is used whenever time permits.

If time permits, subsequent orders are likewise written, either as field orders or messages.

585. The initial combat orders of battalions and smaller units are usually given verbally. For this purpose the subordinates for whom the orders are intended are assembled, if practicable, at a place from which the situation and plan can be explained.

Subsequent orders are verbal or in the form of verbal or written messages. Verbal messages should not be used unless they are short and unmistakable.

586. Usually the orders of a commander are intended for, and are given to, the commanders of the next lower units, but in an emergency a commander should not hesitate to give orders directly to any subordinate. In such case he should promptly inform the intermediate commander concerned.

587. (1) **The combat order** gives such information of the enemy and of neighboring or supporting friendly troops as will enable subordinates to understand the situation.

(2) The general plan of action is stated in brief terms, but enough of the commander's intentions are divulged to guide the subsequent actions of the subordinates.

(3) The commander assigns tasks, fronts, objectives, sectors or areas, etc., in accordance with the plan. If the terms employed convey definite ideas and leave no loopholes, the conduct of subordinates will generally be correspondingly satisfactory. Combat orders should prescribe communication, reconnaissance, flank protection, etc., when some special disposition is desired or when an omission on the part of a subordinate may reasonably be feared.

(4) Such miscellaneous matter relating to special troops, trains, ammunition, and future movements of the commander is added as concerns the combat itself.

588. Combat orders are the expression of a fixed decision and must definitely state the end in view, such as "To attack," or "To take up and defend" a position. Vague or ambiguous orders indicate vacillation and the absence of any definite decision on the part of the officer responsible for them.

Such expressions as "attempt to capture," "try to hold,'' "as far as possible," "as well as you can," etc., are forbidden. They tend to divide responsibility between the commander and his subordinates.

Troops have a right to be told, in terms that are direct and unmistakable, exactly what it is their leader wants them to do.

589. When issuing orders, a commander should indicate clearly what is to be done by each subordinate, but not how it is to be done. He should not encroach upon the functions of a subordinate by prescribing details of execution unless he has good reason to doubt the ability or judgment of the subordinate, and can not substitute another. The order should contain everything beyond the independent authority of the subordinate, but nothing more.

590. When the transmission of orders involves a considerable period of time, during which the situation may change, detailed instructions are avoided. The same rule holds when orders may have to be carried out under unforseen circumstances. In such cases letters of guidance are preferable; they lay stress upon the object to be attained, and leave open the means to be employed. Orders attempting to arrange matters too far in advance may have to be recalled and others substituted; such changes impose needless hardships upon a command and injure its morale.

Details of time and place are carefully stated. Subordinate commanders and staff officers regulate their watches by the time kept at headquarters.

Orders issued by subordinates should not be mere repetitions of those from higher authority with additions of their own. New orders are generally clearer and more satisfactory.

591. Once committed to any line of action, change to another is costly both in men and morale. It is impossible for the higher troop leaders to directly influence the course of action once begun in any way except through the use of such reserves as may be at hand. Modern fire effect will not permit the higher leaders to change abruptly the course of action of troops already engaged by the mere sending of orders, verbal or written, to the commanders of such troops.

Framing Field Orders.

592. The instructions of the preceding articles concerning combat orders apply also to any other variety of field orders. In framing field orders, the standard form of these orders should be adhered to where practicable.

593. Field orders must be clear and definite. Expressions depending upon the view point of the observer, such as right, left, in front of, behind, on this side, beyond, etc., are avoided, reference being made to points of the compass instead. The terms right and left, however, may be applied to individuals or bodies of men, or to the banks of a stream; in the latter case the observer is supposed to be facing downstream. The terms right flank and left flank are fixed designations. They apply primarily to the right and left of a command when facing the enemy and do not change when the command is retreating. The head of a column is its leading element, no matter in what direction the column is facing; the other extremity is the tail.

Field orders are brief; short sentences are easily understood; conjectures, expectations, reasons for measures adopted, and detailed instructions for a variety of possible events, do not inspire confidence, and should be avoided.

In framing field orders the integrity of tactical units is preserved whenever practicable.

594. To minimize the possibility of error, geographical names are written or printed in ROMAN CAPITALS; when the spelling does not conform to the pronunciation, the latter is shown phonetically in parentheses, thus: BICESTER (Bister), GILA (Heé-la).

When two or more places or features on the map have the same name they are distinguished by reference to other points.

A road is designated by connecting two or more names of places on the road with dashes, thus: LEAVENWORTH—LOWEMONT—ATCHISON road.

As a rule an affirmative form of expression is used. Such an order as "The artillery will not accompany the infantry" is defective, because the gist of the order depends upon the single word "not."

Written orders should be so distinct as to be legible even in bad light.

Forms of Complete Field Orders.

595. The following forms used by the United States Army are given for the convenience of officers in the field and with a view of securing uniformity in the service. The sequence in paragraph 3 is not obligatory, the commander arranging the details according to his best judgment. For further forms, see Field Service Regulations, United States Army.

1. For an Advance.

[Title]
[Place]
[Date and hour]

Field Orders
No. —.
[Reference to map used]

Troops
(a) Independent Cavalry:
[Commander]
[Troops]
(b) Advance Guard:
[Commander]
[Troops]
(c) Main Body—in order of march:
[Commander][1]
(d) Right [left] Flank Guard:
[Commander]
[Troops]
(e) Signal Troops:
[Commander]
[Troops]

1. [Information of enemy and of our supporting troops]
2. [Plan of commander]
3. (a) [Instructions for independent cavalry—place and time of departure, roads or country to be covered, special mission]
(b) [Instructions for advance guard—place and time of departure, or distance at which it is to precede the main body, route, special mission]
(c) [Instructions for main body—distance at which it is to follow the advance guard, or place and time of departure]
(d) [Instructions for flank guard—place and time of departure, route, special mission]
(e) [Instructions for signal troops—lines of information to be established, special mission]
(x) [Instructions for outpost—when relieved, subsequent duties]
4. [Instructions for field train—escort, distance in rear of column, or destination when different from that of main body, if disposition not previously covered in "Orders"]
[Instructions for sanitary, ammunition, supply, and engineer trains when necessary]
5. [Place of commander or where messages may be sent]

[Authentication]

[How and to whom issued]

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[1] If a commander is designated for the main body, his name is inserted here.

2. For Outposts.

Field Orders [Title]
No. — [Place]
[Reference to map used] [Date and hour]

Troops
(a) Advance Cavalry:
[Commander]
[Troops]
(b) Supports:[2]
No. 1 [Commander]
[Troops]
No. 2 [Commander]
[Troops]
No. 3 [Commander]
[Troops]
(c) Detached Post:
[Commander]
[Troops]
(d) Reserve:
[Commander]
[Troops]

1. [Information of enemy and of our supporting troops]

2. [Plan of commander—to establish outpost, approximate line of resistance]

3. (a) [Instructions for advance cavalry—contact with enemy, roads or country to be specially watched, special mission]

(b) [Instructions for supports—positions they are to occupy, and sections of line of resistance which they are to hold, intrenching, etc.]

(c) [Instructions for detached post—position to be occupied, duties, amount of resistance]

(d) [Instructions for reserve—location, observation of flanks, conduct in case of attack, duties of special troops]

4. [Instructions for field train if necessary]

5. [Place of commander or where messages may be sent, location of lines of information]

[Authentication]

[How and to whom issued][3]

It is sometimes necessary to issue two outpost orders; the first as above, containing general instructions; the second, issued after an inspection of the line, and containing more definite instructions or involving changes.

3. For an Attack.

Field Orders [Title]
No. — [Place]
[Reference to map used] [Date and hour]

1. [Information of enemy and of our supporting troops]

2. [Plan of commander—indicating the general plan of attack, usually to envelop a flank]

3. (a) [Instructions for artillery—position, first target, generally hostile artillery]

(b) [Instructions for holding attack[4]—commander, troops, direction and objective]

(c) [Instructions for main attack—commander, troops, direction and objective]

(d) [Instructions for reserve—commander, troops, position]

(e) [Instructions for cavalry—generally to operate on one or both flanks, or to execute some special mission]

(f) [Instructions for engineers—any special mission]

(g) [Instructions for signal troops—to establish lines of information between the commander and the main and secondary attacks, artillery, reserves, etc.]

4. [Instructions for sanitary train—location of dressing stations and stations for slightly wounded when practicable]

[Instructions for ammunition train—location of ammunition distributing stations]

[Instructions for field and supply trains, if not previously covered in orders]

5. [Place of commander or where messages may be sent] [Authentication]

[How and to whom issued]

NOTE.—In war it is not always possible to issue a complete attack order like the above, disposing of an entire command. In unexpected encounters, for instance, orders must be given as the situation develops.

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[2] Numbered from the right.

[3] For small outposts it may be more convenient to write this order without a marginal distribution of troops.

[4] The term "holding attack" as used in this form is for convenience only; it is never used in actual orders, as the vigor of an attack might be lessened if the troops knew it was "holding" only.

Communications.

596. Communication is maintained by means of staff officers, messengers, relay systems, connecting files, visual signals, telegraph, or telephone.

597. Each regiment, employing its own personnel, is responsible for the maintenance of communication from the rg. c. back to the brigade and forward to the battalions. For this purpose the regiment uses the various means which may be furnished it. The staff and orderlies, regimental and battalion, are practiced in the use of these means and in messenger service. Orderlies carry signal flags.

598. Connection between the firing line and the bn. c. or rg. c. is practically limited to the prescribed flag, arm, and bugle signals. Other means can only be supplemental.

599. The artillery generally communicates with the firing line by means of its own staff officers or through an agent who accompanies some unit in or near the front. The infantry keeps him informed as to the situation and affords him any reasonable assistance. When the infantry is dependent upon the artillery for fire support, perfect coordination through this representative is of great importance.

Sec. V.—COMBAT RECONNAISSANCE.

600. Combat reconnaissance is of vital importance and must not be neglected. By proper preliminary reconnaissance, deployments on wrong lines, or in a wrong direction, and surprises may generally be prevented.

601. Troops deployed and under fire can not change front and thus they suffer greatly when enfiladed. Troops in close order formation may suffer heavy losses in a short time if subjected to hostile fire. In both formations troops must be protected by proper reconnaissance and warning.

602. The difficulty of reconnaissance increases in proportion to the measures adopted by the enemy to screen himself.

The strength of the reconnoitering party is determined by the character of the information desired and the nature of the hostile screen. In exceptional cases as much as a battalion may be necessary in order to break through the hostile screen and enable the commander or officer in charge to reconnoiter in person.

A large reconnoitering party is conducted so as to open the way for small patrols, to serve as a supporting force or rallying point for them, and to receive and transmit information. Such parties maintain signal communication with the main body if practicable.

603. Each separate column moving forward to deploy must reconnoiter to its front and flank and keep in touch with adjoining columns. The extent of the reconnaissance to the flank depends upon the isolation of the column.

604. Before an attack a reconnaissance must be made to determine the enemy's position, the location of his flanks, the character of the terrain, the nature of the hostile field works, etc., in order to prevent premature deployment and the resulting fatigue and loss of time.

It will frequently be necessary to send forward a thin skirmish line in order to induce the enemy to open fire and reveal his position.

605. It will frequently be impossible to obtain satisfactory information until after the action has begun. The delay that may be warranted for the purpose of reconnaissance depends upon the nature of the attack and the necessity for promptness. For example, in a meeting engagement, and sometimes in a holding attack, the reconnaissance may have to be hasty and superficial, whereas in an attack against an enemy carefully prepared for defense there will generally be both time and necessity for thorough reconnaissance.

606. In defense, reconnaissance must be kept up to determine the enemy's line of advance, to ascertain his dispositions, to prevent his reconnaissance, etc.

Patrols or parties posted to prevent hostile reconnaissance should relieve the main body of the necessity of betraying its position by firing on small bodies of the enemy.

607. Reconnaissance continues throughout the action.

A firing or skirmish line can take care of its front, but its flanks are especially vulnerable to modern firearms. The moral effect of flanking fire is as great as the physical effect. Hence, combat patrols to give warning or covering detachments to give security are indispensable on exposed flanks. This is equally true in attack or defense.

608. The fact that mounted patrols are known to be posted in a certain direction does not relieve infantry commanders of the responsibility for reconnaissance and security.

To be surprised by an enemy at short range is an unpardonable offense.

609. The commander of a unit on a flank of a general line invariably provides for the necessary reconnaissance and security on that flank unless higher authority has specifically ordered it. In any event, he sends out combat patrols as needed.

Where the unit is on a flank of one section of the line and a considerable interval lies between the unit and the next section, he makes similar provision. In anticipation of the occurrence of gaps between attacking units, strong combat patrols are usually detailed by battalions and larger units prior to engagement, for the purpose of maintaining tactical contact with adjacent units.

Organization commanders in the first line establish patrols to observe and report the progress or conduct of adjoining troops when these can not be seen.

Sec. VI.—DEPLOYMENT.

610. Units are deployed in depth and in frontage. These two factors are mutually interdependent. Units which are required to make a slight advance are deployed in relatively slight depth and may therefore be assigned an extended frontage. On the other hand, units of whom a considerable penetration is required must be deployed in relatively great depth. As a general rule, a definite frontage is assigned to an attacking unit; from the frontage assigned, other factors such as the nature of the terrain being also considered, the unit commander should be able to deduce the depth of deployment and dispose the component parts of his command accordingly.

611. The depth of deployment will vary greatly along the front of an attacking force. Where the maneuver to be executed involves penetration of the hostile front, it will generally be greatest at those points that most favor the advance and least in front of points which are naturally strongest and most difficult of reduction. If the maneuver be one of envelopment, the greatest depth will exist on the flank in extension of which the envelopment is to take place; fronts which have only a holding or supporting mission, attack in relatively slight depth and great extension.

612. To gain decisive results, it will generally be necessary to use all the troops at some stage of the combat. But in the beginning, while the situation is uncertain, care should be taken not to engage too large a proportion of the command. In the original deployment, the strength of the reserve held out by each commander may comprise from one-sixth to two-thirds of his unit. On the other hand, do not employ too few and sacrifice them in driblets.

In addition to the necessity of holding out reserves for the purpose of meeting unexpected emergencies, the strength of reserves is controlled by the relation of depth and frontage as set forth in paragraph 610.

613. The density of the whole deployment decreases with the size of the command because the larger the command the greater the depth

of deployment. Thus, a battalion acting alone may attack with two men per yard of front, but a regiment with three battalions may only double the front of one battalion.

614. In the deployment, companies establish the assaulting echelon each furnishing its own support. In each unit larger than a company, a reserve is held out.

The function of the support is, in principle, the reinforcement of the assaulting echelon and the protection of its flanks. Reinforcement may take place by increasing the density of the echelon or filling up gaps, or by prolongation of the echelon (enveloping action).

Reserves are primarily maneuvering bodies whose rôle is the outflanking of points of resistance developed by assaulting echelons, the continuation of the action of assaulting echelons when these become exhausted, and the taking in flank of resistances holding out in front of adjacent units.

615. When the deployment can be made deliberately, under the protection of troops already in position, units are conducted to predetermined places of deployment and formed for attack, usually under the cover of darkness. Silence and order in forming up are indispensable.

616. Troops are massed preparatory to deployment when the nature of their deployment can not be foreseen, or it is desirable to shorten the column or clear the road.

617. Where time does not permit of a deliberate deployment regulated in detail, large commands are ordinarily first formed into line of columns to facilitate the extension of the front prior to deploying. These columns march on assigned direction lines and take up an approach formation as soon as they enter the zone of the enemy's artillery fire. In approach formation, distances and intervals should be so regulated that no two elements can be taken under the burst of the same hostile shell.

618. During the approach march, systematic reconnaissance is carried out with a view to locating shelled areas. Such areas and other points such as villages, defiles, small woods, etc., likely to have been registered by hostile artilllery, are avoided. These considerations are more important than considerations of cover.

619. The approach march is conducted in a series of bounds; the column directs its march successively from one to another of a series of successive points which define the route of advance. The advance is conducted under the protection of covering detachments. Protection against low-flying airplanes is assured by assignment of machine guns to anti-aircraft missions.

620. Where practicable, the infantry moves across country, leaving roads free for traffic.

621. Each subordinate commander, after receiving his order for action, should precede his command, as far as possible in order to reconnoiter the ground personally, and should prepare to issue his order promptly. Each commander of a first-line battalion should reconnoiter and locate a position under cover of which the battalion can be formed for attack and objectives assigned to companies without danger of surprise.

622. The premature deployment into combat formation causes unnecessary fatigue and loss of time, and may result in a faulty direction being taken. Troops once deployed make even minor changes with difficulty, and this difficulty increases with the frontage of the echelons.

623. In the larger units, when the original deployment is found to be in the wrong direction, it will usually be necessary to deploy reserves on the correct front, and withdraw and assemble the leading echelon.

624. When practicable, direction lines should be maintained by compass bearings. Where landmarks only are assigned, misunderstandings will frequently arise, and units will be found attacking obliquely across the line of advance of other troops. This results in troops being crowded in some areas while other areas remain vacant.

With the proper use of the compass, no difficulty will be encountered either in wooded or open country in the maintenance of proper lines of advance. Painstaking training is required for both officers and men in marching across country and through timber by compass direction.

625. When it is intended to fight to a decision, fire superiority is essential. To gain this, two things are necessary: A heavy fire and a fire well directed and controlled. Both of these are best obtained when the firing line is as dense as practicable, while leaving the men room for the free use of their rifles.

If the men are too widely separated, direction and control are very difficult, often impossible, and the intensity of fire is slight in proportion to the front occupied.

626. In an attack or stubborn defense the firing line should have a density of one man per yard of front occupied.

Where the tactical situation demands the holding of a line too long to be occupied throughout at this density, it is generally better to deploy companies or platoons at one man per yard, leaving gaps in the line between them, than to distribute the men uniformly at increased intervals.

627. A relatively thin firing line may be employed when merely covering the movements of other forces; when on the defensive against poor troops; when the final action to be taken has not yet been determined; and, in general, when fire superiority is not necessary.

628. The length of the firing line that the whole force may employ depends upon the density of the line and the **strength in rear** required by the situation.

Supports and reserves constitute the strength in rear.

In a decisive attack they should be at least strong enough to replace a heavy loss in the original firing line and to increase the charging line to a density of at least one and one-half men per yard and still have troops in rear for protection and for the other purposes mentioned above.

629. A small force in a covering or delaying action requires very little strength in rear, while a large force fighting a decisive battle requires much. Therefore, depending upon circumstances, the original deployment, including the strength in rear, may vary from 1 to 10 men per yard. Against an enemy poorly disciplined and trained, or lacking in morale, a thinner deployment is permissible.

630. The general deployment for a long line of battle comprising several battle districts is not directly considered in these regulations. The deployments treated of herein are those of the infantry within such districts.

The density of deployment in these districts may vary greatly, depending upon the activity expected in each. Within these battle districts, as well as in smaller forces acting alone, parts of the line temporarily of less importance may be held weakly, in order to economize troops and to have more at the decisive point.

631. The front that a unit may occupy when deployed depends also upon whether its flanks are secured. If both flanks are secured by other troops, the unit may increase its front materially by reducing its reserve or supports. If only one flank is so secured, the front may still be somewhat increased; but the exposed flank must be guarded by posting the supports or reserve toward that flank.

Natural obstacles that secure the flanks have practically the same effect upon deployment.

632. Except when assigned as supports or reserve, regiments in the brigade, battalions in the regiment, and companies in the battalion are, when practicable, deployed side by side.

633. In the deployment, battalions establish the firing line, each furnishing its own support.

In each unit larger than the battalion a reserve is held out, its strength depending upon circumstances. In general, the reserve is employed by the commander to meet or improve conditions brought about by the action of the firing line. It must not be too weak or too split up. It must be posted where the commander believes it will be needed for decisive action, or where he desires to bring about such action. When necessary, parts of it reinforce or prolong the firing line.

Deployment for Attack.

634. Where open terrain exposes troops to hostile artillery fire it may be necessary to make the deployment 2 miles or more from the hostile position.

The foreground should be temporarily occupied by covering troops. If the enemy occupies the foreground with detachments, the covering troops must drive them back.

To enable large forces to gain ground toward the enemy, it may sometimes be cheaper and quicker in the end to move well forward and to deploy at night. In such case the area in which the deployment is to be made should, if practicable, be occupied by covering troops before dark.

The deployment will be made with great difficulty unless the ground has been studied by daylight. The deployment gains little unless it establishes the firing line well within effective range of the enemy's main position. (See Night Operations, Art. 1046 et seq,)

635. Each unit assigned a task deploys when on its direction line, or opposite its objective, and when it has no longer sufficient cover for advancing in close order. In the firing line, intervals of 25 to 50 yards should be maintained as long as possible between battalions. In the larger units it may be necessary to indicate on the map the direction or objective, but to battalion commanders it should be pointed out on the ground.

636. The reserve is kept near enough to the firing line to be on hand at the decisive stage. It is posted with reference to the attack, or to that part of the attacking line, from which the greater results

are expected; it is also charged with flank protection, but should be kept intact.

Supports are considered in Arts. 742, 773, 778, 808 et seq., 822 et seq., 837.

Sec. VII.—ADVANCING THE ATTACK.

637. Where troops are not in contact with the enemy prior to the attack, the assaulting echelon must ordinarily advance a long distance before it is justified in opening fire. It can not combat the enemy's artillery, and it is at a disadvantage if it combats the defender's long-range rifle and machine-gun fire. Hence it ignores both, and by taking full advantage of cover and of the discipline of the troops, advances to a first firing position at the shortest range possible.

638. At long range, the best protection of advancing troops against loss consists in their own movement and the utilization of cover from view. It should be impressed on all ranks that cover alone does not diminish losses, but that their best protection consists in the most rapid possible advance to a point where they can make most effective use of their own weapons. By clinging to cover and opening fire at long range, they play into the enemy's hands by engaging in a fire fight in which they are at a relative disadvantage, and moreover constitute a stationary target upon which his artillery can easily range.

It will sometimes be necessary to cross fire-swept zones by the advance of individuals who work their way forward separately and re-form on a designated position.

639. It will frequently become necessary for infantry moving to the attack to pass through deployed artillery. This should be done so as to interfere as little as possible with the latter's fire, and never so as to cause that fire to cease entirely. As far as practicable, advantage should be taken of intervals in the line. An understanding between artillery and infantry commanders should be had, so as to effect the movement to the best advantage.

The Fire Attack.

640. When the effectiveness of hostile fire makes it impossible for the assaulting troops to progress without opening fire, they must continue their advance under the protection of their own fire, the fire of artillery and machine guns, and that of the accompanying weapons.

641. At the first firing position, attacking units seek to gain fire superiority over the opposing resistances. This may necessitate a steady, accurate fire for a long time. The object is to subdue the enemy's fire and keep it subdued so that the attacking troops may advance from this point to a favorable place near the enemy from which the assault may be delivered.

642. Assaulting units advance from one cover or firing position to another by successive rushes, the movement of advancing fractions being covered by the fire of those remaining in position. Diminution of the enemy's fire and a pronounced loss in effectiveness are the surest signs that fire superiority has been gained and that a part of the attacking group can advance. Enough rifles must be continued in action to keep down the enemy's fire; this determines the size of the fraction rushing.

643. Every lull in hostile fire is utilized to push groups to the front and occupy the natural strong points of the terrain from which covering fire, particularly that of automatic rifles, can be delivered to facilitate the further progress of the assaulting units.

644. The attack will not generally encounter a uniformly held, continuous line of defense. It will have to overcome a defense disposed in depth and a series of centers of resistance or strong points covering the main routes of advance, with relatively lightly held intervening intervals. By a stubborn defense of these strong points, the defense will seek to limit the penetrating action of the attack and overwhelm by counterattack the assaulting elements which succeed in penetrating its front.

There will consequently be inequality in the resistance encountered on the front of attack. Certain units of considerable size will be held up in front of the stronger centers of resistance. Others, which encounter only minor resistances, press forward as rapidly as possible without regard to the progress of units on their flanks and attempt to outflank the main hostile resistances. The battle thus becomes a series of local combats carried on by units of varying importance. The combat is not carried on by continuous lines, but by groups disposed in depth and capable of acting in any direction.

645. Sections of the assaulting echelon held up are not reinforced when the resistance in their front can be outflanked. By their own fire and that of the accompanying weapons, they attempt to neutralize or mask the opposing resistances and prevent them from enfilading the attacking elements advancing on their flanks.

646. In principle, assaulting units endeavor to obtain superiority of fire over the defensive elements into which the hostile dispositions are broken up, by enveloping action. While the assaulting echelon seeks to approach as closely as possible to the hostile position and immobilize the enemy with its fire and that of the accompanying weapons and machine guns, additional forces are brought up on the flanks to envelope the enemy or gain his rear.

The advantage of the enveloping action consists in the longer line with consequent superiority in the number of weapons in action and in convergent fire as opposed to the enemy's divergent fire. In many cases, however, the mutual flanking of hostile centers of resistance will be unfavorable to enveloping action. In such case frontal attack will be necessary.

647. Where the opposing resistance consists of isolated machine-gun nests, the precision of the accompanying weapons at close range is often sufficient to put the enemy out of action. In any event, their fire will cover the advance of the infantry to close range and prepare for its assault. They may also be used to assist the infantry to outflank points of resistance by neutralizing the flank toward the infantry. In some cases this neutralization may be effected by the use of smoke barrages.

648. It is the special duty of supports and reserves during the advance to take timely measures in anticipation of hostile counterattack. They utilize all lulls in the action to occupy the natural strong points of the terrain and dispose machine guns and accompanying weapons so as to check any hostile reaction.

649. The deep disposition of attacking units does not imply a passive following of the assaulting echelon by supports and reserves. On the contrary, one of the purposes of the disposition in depth is to enable the attacking units to act in any direction. Commanders of supports and reserves must keep in touch with the situation on their front and flanks by constant reconnaissance and be ready to act on their own initiative in the execution of the various missions which the situation may impose. These missions may involve the protection of the flanks of neighboring units by the attack of counterattacking hostile forces; wheeling into an adjacent sector for the purpose of taking in flank hostile resistances still holding out; covering gaps which may arise between adjacent assaulting units. For supports and reserves no less than for assaulting units there is no reason for continued inaction on the battle field.

650. Supports and reserves are in principle put into action where least losses are being suffered rather than where they are greatest. All commanders must endeavor to locate the points where the enemy is offering least resistance in order to exploit any weakness he may develop by the use of troops in rearward echelons.

Fire Superiority.

Purpose and Nature.

651. In a decisive battle success depends on gaining and maintaining fire superiority. Every effort must be made to gain it early and then keep it.

Attacking troops first must gain fire superiority in order to reach the hostile position. Over open ground attack is possible only when the attacking force has a decided fire superiority. With such superiority the attack is not only possible but success is probable and without ruinous losses.

Defending troops can prevent a charge only when they can master the enemy's fire and inflict heavy losses upon him.

652. To obtain fire superiority it is necessary to produce a heavy volume of accurate fire. Every increase in the effectiveness of the fire means a corresponding decrease in the effectiveness of the enemy's fire.

The volume and accuracy of fire will depend upon several considerations:

(a) **The number of rifles employed.**—On a given front the greatest volume of fire is produced by a firing line having only sufficient intervals between men to permit the free use of their rifles. The maximum density of a firing line is therefore about one man per yard of front.

(b) The **rate** of fire affects its volume; an excessive rate reduces its accuracy.

(c) **The character of the target** influences both volume and accuracy. Larger dimensions, greater visibility, and shorter range increase the rate of fire; greater density increases the effect.

(d) **Training and discipline** have an important bearing on the rate or volume of fire, but their greatest influence is upon accuracy.

The firing efficiency of troops is reduced by fatigue and adverse psychological influences.

(e) **Fire direction and control** improve collective accuracy. The importance of fire direction increases rapidly with the range. Control exerts a powerful influence at all ranges.

Fire Direction and Control.

Opening Fire.

653. Beyond effective ranges important results can be expected only when the target is large and distinct and much ammunition is used.

Long-range fire is permissible in pursuit on account of the moral effect of any fire under the circumstances. At other times such fire is of doubtful value.

654. In attack, the desire to open fire when losses are first felt must be repressed. Considerations of time, target, ammunition, and morale make it imperative that the attack whithold its fire and press forward to a first firing position close to the enemy. The attacker's target will be smaller and fainter than the one he presents to the enemy.

655. In defense, more ammunition is available, ranges are more easily determined, and the enemy usually presents a larger target. The defender may therefore open fire and expect results at longer ranges than the attacker, and particularly if the defenders intend a delaying action only.

If the enemy has a powerful artillery, it will often be best for the defending infantry to withhold its fire until the enemy offers a specially favorable target. Vigorous and well-directed bursts of fire are then employed. The troops should therefore be given as much artificial protection as time and means permit, and at an agreed signal expose themselves as much as necessary and open fire.

656. In unexpected, close encounters a great advantage accrues to the side which first opens rapid and accurate fire with battle sight.

Use of Ground.

657. The position of the firers must afford a suitable field of fire.

The ground should permit constant observation of the enemy, and yet enable the men to secure some cover when not actually firing.

Troops whose target is for the moment hidden by unfavorable ground, either move forward to better ground or seek to execute cross fire on another target.

658. The likelihood of a target being hit depends to a great extent upon its visibility. By skillful use of ground, a firing line may reduce its visibility without loss of fire power. Sky lines are particularly to be avoided.

Choice of Target.

659. The target chosen should be the hostile troops most dangerous to the firers. These will usually be the nearest hostile infantry. When no target is specially dangerous, that one should be chosen which promises the most hits.

660. Frequent changes of target impair the fire effect. Random changes to small unimportant targets impair fire discipline and accomplish nothing. Attention should be confined to the main target until substantial reason for change is apparent.

661. An opportunity to deliver flanking fire, especially against artillery protected in front by shields, is an example warranting change of target and should never be overlooked. Such fire demoralizes the troops subjected to it even if the losses inflicted are small. In this manner a relatively small number of rifles can produce important results.

The Range.

662. Beyond close range, the correct setting of the rear sight is of primary importance, provided the troops are trained and well in hand. The necessity for correct sight setting increases rapidly with the range. Its importance decreases as the quality of the troops decrease, for the error in sight setting, except possibly at very long ranges, becomes unimportant when compared with the error in holding and aiming.

663. In attack, distances must usually be estimated and corrections made as errors are observed. Mechanical range finders and ranging volleys are practicable at times.

In defense, it is generally practicable to measure more accurately the distances to visible objects and to keep a record of them for future use.

Distribution of Fire and Target.

664. The purpose of fire superiority is to get hits whenever possible, but at all events to keep down the enemy's fire and render it harmless. To accomplish this the target must be covered with fire throughout its whole extent. Troops who are not fired upon will fire with nearly peace-time accuracy.

The target is roughly divided and a part is assigned to each unit. No part of the target is neglected. In attack, by a system of overlapping in assigning targets to platoons, the entire hostile line can be kept under fire even during a rush.

Observation.

665. The correctness of the sight setting and the distribution of fire over the target can be verified only by careful observation of the target, the adjacent ground, and the effect upon the enemy.

666. Observation only can determine whether the fire fight is being properly conducted. If the enemy's fire is losing in accuracy and effect, the observer realizes that his side is gaining superiority. If the enemy's fire remains or becomes effective and persistent, he realizes that corrective measures are necessary to increase either their volume or accuracy, or both.

Discipline.

667. Discipline makes good direction and control possible and is the distinguishing mark of trained troops.

668. The discipline necessary in the firing line will be absent unless officers and noncommissioned officers can make their will known to the men. In the company, therefore, communication must be by simple signals which, in the roar of musketry, will attract the attention and convey the correct meaning.

Expenditure of Ammunition.

669. In attack the supply is more limited than in defense. Better judgement must be exercised in expenditure. Ordinarily, troops in the firing line of an attack can not expect to have that day more ammunition than they carry into the combat, except such additions as come from the distribution of ammunition of dead and wounded and the surplus brought by reinforcements.

670. When a certain fire effect is required, the necessary ammunition must be expended without hesitation. Several hours of firing may be necessary to gain fire superiority. True economy can be practiced only by closing on the enemy before first opening fire and thereafter suspending fire when there is nothing to shoot at.

Supporting Artillery.

671. Artillery fire is the principal aid to the infantry in gaining and keeping fire superiority, not only by its hits, but by the moral effect it produces on the enemy (see Art. 2067 et seq.).

672. In attack, artillery assists the forward movement of the infantry. It keeps down the fire of the hostile artillery and seeks to neutralize the hostile infantry by inflicting losses upon it, destroying its morale, driving it to cover, and preventing it from using its weapons effectively.

As soon as the decision to assault is made, all the fire that can be brought to bear by artillery, machine guns, fire of position, and from other parts of the firing line will be directed upon that part of the enemy's lines selected for assault. The artillery must support this assault to the end, regardless of the losses it may sustain, and must continue its fire up to the moment of the charge, even at the risk of some of its projectiles striking among its own infantry.

In defense, artillery ignores the hostile artillery when the enemy's attack reaches a decisive stage and assists in checking the attack, joining its fire power to that of the defending infantry.

673. Troops should be accustomed to being fired over by friendly artillery and impressed with the fact that the artillery should continue firing upon the enemy until the last possible moment. The few casualties resulting from shrapnel bursting short are trifling compared with those that would result from the increased effectiveness of the enemy's infantry fire were the friendly artillery to cease firing.

Casualties inflicted by supporting artillery are not probable until the opposing infantry lines are less than 200 yards apart.

674. When the distance between the hostile infantry lines becomes so short as to render further use of friendly artillery inadvisable, the commander of the infantry firing line, using a preconcerted signal, informs the artillery commander. The latter usually increases the range in order to impede the strengthening of the enemy's foremost line.

Fire of Position.

675. Infantry is said to execute fire of position when it is posted so as to assist an attack by firing over the heads, or off the flank, of the attacking troops and is not itself to engage in the advance; or when, in defense, it is similarly posted to augment the fire of the main firing line.

Machine guns serve a like purpose. (See Art. 2150.)

In a decisive action, fire of position should be employed whenever the terrain permits and reserve infantry is available.

Sec. VIII.—THE ASSAULT.

676. Except where the opposing troops have been in contact for a considerable time, the assault can not generally be conducted on an extended front. Inequality of the resistance and the necessity of immediately taking advantage of weakening in the hostile resistance, wherever it occurs, will produce local assaults executed by small units and combat groups. The assault should be delivered by each unit at the earliest moment that promises success.

677. Where the assault is prepared by the fire of artillery, machine guns, and accompanying weapons, their fire ceases or is lifted off the

objective either at a prearranged hour or by preconcerted signal (rocket).

678. Fire superiority beats down the enemy's fire, destroys his resistance and morale, and enables the attacking troops to close on him, but an actual or threatened occupation of his position is needed to drive him out and defeat him.

The psychological moment for the charge can not be determined far in advance. The tactical instinct of the responsible officer must decide.

679. The defenders, if subjugated by the fire attack, will frequently leave before the charge begins. On the other hand, it may be necessary to carry the fire attack close to the position and follow it up with a short dash and a bayonet combat. Hence, the distance over which the charge may be made will vary between wide limits. It may be from 25 to 400 yards.

The charge should be made at the earliest moment that promises success; otherwise the full advantage of victory will be lost.

680. The commander of the attacking line should indicate his approval, or give the order, before the charge is made. Subordinate commanders, usually battalion commanders, whose troops are ready to charge signal that fact to the commander.

At the signal for the charge the firing line and near-by supports and reserves rush forward. (See Art. 779.)

The charge is made simultaneously, if possible, by all the units participating therein, but, once committed to the assault, battalions should be pushed with the utmost vigor, and no restraint placed on the ardor of charging troops except to maintain alignment.

681. Before ordering the charge, the commander should see that enough troops are on hand to make it a success. Local reserves joining the firing line in time to participate in the charge give it a strong impetus. Too dense a mass should be avoided.

682. The line should be strengthened by prolongation, if practicable, and remaining troops kept in formation for future use; but rather than that the attack should fail, the last formed body will be sent in, unless it is very apparent that it can do no good.

683. To arrive in the hostile position with a very compact firing line and a few formed supports is sufficient for a victory, but an additional force kept well in hand for pursuit is of inestimable value.

684. A premature charge by a part of the line should be avoided, but if begun, the other parts of the line should join at once if there is any prospect of success. Under exceptional conditions a part of the line may be compelled to charge without authority from the rear. The intention to do so should be signaled to the rear.

685. Confidence in their ability to use the bayonet gives the assaulting troops the promise of success.

686. After a successful assault, the situation will determine whether to follow up the enemy in pursuit or organize the position for defense against counterattack. Rapid fire should be opened on the retreating enemy if he is in sight. It is not generally advisable for units mixed and disorganized by the assault to follow the enemy. The pursuit should be immediately undertaken by the nearest organized echelons, and the assaulting troops reorganized and placed in support.

687. If the assault fails, the assaulting troops must dig in and hold their ground. To attempt to withdraw would result in annihilation. If the assault is to be repeated, fresh troops must be sent in as reinforcements, and the fire preparation for the assault renewed.

688. Where the attack succeeds in penetrating through the defensive position on a broad front, the infantry must be organized in still greater depth. Column of march is resumed as soon as the range of hostile guns permits, security detachments are sent out, and the cavalry maintains contact.

Should mounted troops or aviators discover hostile guns within range, infantry must take up an approach formation and make ready to reconnoiter and attack.

Pursuit.

689. To reap the full fruits of victory a vigorous pursuit must be made. The natural inclination to be satisfied with a successful charge must be overcome. The enemy must be allowed no more time to reorganize than is positively unavoidable.

690. The part of the reserve that is still formed or is best under control is sent forward in pursuit and vigorously attacks the enemy's main body or covering detachments wherever found.

The artillery delivers a heavy fire upon the retreating enemy; the disordered attacking troops secure the position, promptly re-form, and become a new reserve.

691. If the captured position is a section of the general line, the breach should be heavily occupied, made wider, and strongly secured by drawing on all reserves in the vicinity.

692. After the pursuit from the immediate battle field, pursuit by parallel roads is especially effective where large commands are concerned.

Artillery and cavalry are very effective in pursuit.

Sec. IX.—POSITION WARFARE.

693. The attack of a carefully prepared trench system is characterized by a powerful artillery preparation and the simultaneous launching in assault at a prescribed hour of large masses of infantry, widely deployed and organized in depth, the assaulting waves being preceded by a rolling barrage. For an attack of this kind, all action is regulated down to the minutest details of time and space by superior authority. The action of all forces that take part in the attack proceeds according to prearranged schedule. The initiative of subordinates is reduced to a minimum. The essentials for success are reconnaissance to determine the precise location and nature of the enemy's defenses and the resistance to overcome, systematic organization for the particular end in view, and methodical execution. The infantry overcomes the enemy by the mere fact of advancing.

An engagement of this kind is not the end but merely the means to an end. It has for its purpose the forcing of the enemy into the open where his masses may be decisively attacked and destroyed.

694. Having determined the location, composition, strength, and disposition of the forces of the defense, the offense selects the point and direction for attack. On a large front, it may be made against a section which is generally poorly organized, weakly held, with a few reserves, etc., which invites capture. It is generally greatly influenced by strategical considerations. Locally, the point and direction of attack is governed by tactical considerations. The main attacks may be made against weak points of the position or up valleys or ravines under cover of fog or smoke, with a view to penetrating the position and taking strong points from the flanks or rear.

695. In order that the attacking troops may close with the enemy, they must gain fire superiority over the defense. The offense attempts to gain fire superiority:

(a) By a preparatory bombardment which has as its object the destruction or neutralization of important elements of the defense, and the opening of lanes of advance for the infantry in the hostile accessory defenses. The fire of artillery, trench mortars, and machine guns is directed against important elements of the defense (obstacles, machine-gun emplacements, artillery emplacements, points of resistance, observation posts, command posts, dugouts, routes of communication, etc.). A long bombardment of several days duration is destructive of the effect of surprise which is necessary to the success of the attack. Such a bombardment will, moreover, never succeed in effecting a complete destruction of the enemy's defenses. The artillery preparation should therefore be limited to the extent necessary to destroy or neutralize the more important features of the hostile defense and to paralyze the action of the defending forces, with a view to exploiting the enemy's weakness by the immediate action of the infantry.

(b) During the advance to the attack, by artillery, light mortar, and one-pounder bombardment directed against elements of the defense which have been located or suspected, and by a timed artillery and machine-gun barrage which the infantry may follow at a distance of about 100 yards. This is supplemented by machine guns, light mortars, one-pounders, automatic rifles, rifles, and by artillery using indirect or direct fire, which supports or accompany the infantry and direct their fire against points of resistance which still hold out. Sections of the advance held up add their automatic rifle and rifle fire to the above and support the advance of the remainder. (Tanks may be employed to reinforce this fire and support the infantry if operating with the army.)

696. Protected by such natural and artificial features of the ground as may be found, and by the fire mentioned in paragraph 695 (b) above, these various echelons advance to the attack in successive waves. Each wave of the assaulting battalion usually has a strength of about one man per five yards of front; under cover of darkness or fog, this density may be increased. When sections of the advance wave are held up, they are not reinforced for a frontal attack, but together with light mortars, machine guns, one-pounders, and artillery, they attempt to gain fire superiority over the points of resistance of the defense and hold down their fire. The remaining sections of the advance waves and the supports and reserves of the attack, closely following the barrage (if there be one), attempt to penetrate the position of the defense and attack the points of resistance on the flanks and rear. The infantry of the attack is thus placed not only within assaulting distance on the front of points of resistance, but also on their flanks and rear. The fight then becomes an infantry combat supported by light mortars, one-pounders, and machine guns. Artillery support for a time is more or less uncertain.

697. The assault is executed by units disposed in depth. The various successive lines have taken the name "waves," but this term does not imply a uniform formation. The wave is not a rigid line advancing directly forward. Waves are formed by placing elements abreast, either in line of skirmishers or in line of small columns. These elements are thus well controlled and flexible, and are always capable of being handled at the will of the commander. The assault formation must be accommodated to the terrain and to the hostile dispositions. It is not desirable to lay down hard and fast rules as to the formations to be adopted in an attack.

698. The general attack, after the breach of a systematically defended position, splits up into a series of separate combats. Unlike the trench-to-trench attack, the details of this phase of the action can not be fixed in advance. The course of events is sure to be other than what can be foreseen, and under these circumstances, if details have been prescribed in advance, subordinate commanders will be in doubt as to whether they should strive to carry out the original plan or whether they should act on their own initiative. Freedom of action and the satisfaction engendered by responsibility will be lacking.

These separate combats must be directed by brigade and subordinate commanders within the zones of action assigned them and with the means at their disposal. Fresh hostile resistance must be quickly overrun and the enemy prevented from withdrawing his guns and reestablishing his infantry in a new position. Firm control of the troops, coordinated effort within the units, and energetic leading are necessary for a sustained progression. The extent of the success will be measured by the initiative and boldness of the subordinate commanders and their capacity for quick adaptation to the changing conditions of combat and terrain.

699. The combat phase which follows the breach of a fortified position is characterized by the attack of hostile machine-gun nests and strong points usually echeloned in depth and disposed so as to flank the intervening intervals.

The reduction of these points and the further progress of the advance takes place in accordance with the general principles of the attack as set forth in preceding paragraphs of these regulations.

700. After cessation of, or loss of contact with, the creeping barrage. the advance of the attacking waves is covered by scouts. Their mission is to compel the hostile machine-gun nests to open fire and thus disclose their location.

Holding Attack.

701. This, as the name implies, is for the purpose of holding the enemy to his position by offensive action in one part of the field while a decisive blow in the nature of an assault or of an enveloping or a turning movement is struck in another quarter. The governing idea of the holding attack is to make it energetic enough to deceive the enemy, in order that he may use as many of his troops as possible in resisting it, even drawing upon his reserves for such purpose. Early development of the maximum volume of rifle and artillery fire is therefore essential, and for that reason the deployment is on extended lines. Supports and reserves are reduced to the minimum that will be needed to replace losses, secure the flanks, and strengthen those parts of the line against which the enemy might act most aggressively. Holding attacks differ from delaying actions, in that the guiding principle in the former is offense and in the latter defense. The holding force may be called upon to push the attack to the point of an assault, and in the end will join in the advance to the enemy's position when the decisive attack has succeeded. Care must be taken that the holding attack does not, because of promising conditions in its front, make a premature assault on the enemy's line and be defeated before the decisive blow can be struck in another part of the field. There is danger, also, in prematurely pushing this attack so far that its weakness or its intentions may be disclosed to the enemy and give him the opportunity to defeat the entire force in detail.

Sec. X.—THE PLATOON.

702. The platoon is the smallest infantry unit which is habitually deployed in depth and endowed with independent power of maneuver. It is the largest unit admitting of direct personal leadership and fire control in combat. It comprises two sections, each under a leader who, in principle, exercises direct control over his unit in all phases of battle.

703. The combat can not, however, always be carried to a finish by the original units. Temporary groups will frequently result from the incidents of the fight or the conditions of the terrain. Whenever temporary groups arise, each group, even though composed of a handful of men, must have a leader. This leader, whether he be a petty officer or private, must rise spontaneously to direct his comrades, carry them forward when they hesitate, and prevent them from giving ground. Temporary groups deploy, advance, and fire in the same way as normal units. All that is stated below with reference to the section applies equally to the group, whatever its strength.

704. Before the engagement, it is imperative that the company commander designate men to replace the leaders of platoons, sections, and squads in case of casualties, so that the assumption of command will be automatic.

Leaders.

705. The platoon is commanded by a leader, aided by the platoon first petty officer. The platoon 1st p. o. replaces the platoon leader when the latter becomes a casualty.

706. The platoon leader commands his platoon by means of commands and signals. He is at all times responsible for the maintenance of the direction of march of his platoon and for connection with the base platoon. The integrity of the platoon is preserved by observance of the direction assigned and by maintenance of connection with the base squad.

In the advance to the attack, the platoon leader, accompanied by his runners, is sufficiently in advance of his platoon to make the reconnaissance necessary for the proper leading of his platoon. During the fire fight, his position is at the head or in the center of his platoon. He is not bound to any fixed post.

When the platoon is deployed in two waves, it is the special duty of the platoon 1st p. o. to maintain connection between the platoon leader and his second wave, to prevent the second wave from becoming prematurely merged in the leading wave and to direct the engagement of the second wave when so instructed by the platoon leader or when the situation requires it.

707. The section leader guides his unit. He looks at it only when his exercise of control demands it—his eyes should be fastened on the enemy. The section must be bound to its leader, who, under all circumstances, is the rallying point. His bearing and his pace sets the standard for the unit.

708. At short ranges, the platoon and section leaders abstain from useless gestures, which might disclose their location to the enemy.

709. The squad leaders maintain the positions assigned them and see that the platoon and section leaders' orders are executed. They transmit the commands and signals when necessary, observe the conduct of their squads, and assist in enforcing fire discipline. When the ability of platoon and section leaders to control the action of their units ceases, squad leaders lead their squads on their own initiative, lending each other mutual support.

General Principles of Attack.

710. In either position or open warfare, the tactics of the platoon in attack resolve themselves in the majority of cases into the method of attack of tactical points. A tactical point may be described as a locality, the possession of which is of the first importance locally to either side. It may take the form of any of the following: "A strong point," a piece of ground furnishing an advantageous fire position or good observation, a bank, a hedge, a house, or any locality of limited dimensions.

The tactics to be employed may be summarized as follows:

(1) Push on to the objective with the fixed determination of getting in with the bayonet as soon as possible.

(2) If held up by a hostile resistance, open as heavy a fire as possible with a view to immobilizing the enemy and facilitating an envelopment of the resistance. Bring up units from the second wave on one or both flanks of the first wave under the protection of its fire. Movements under covering fire, especially that of rifle grenades the stock of which is limited, must be as rapid as possible. If possible, use automatic rifles to open flanking fire as soon as the best way of employing them has been determined by reconnaissance.

(3) If it is impossible, on account of flanking fire from other hostile localities situated to the flank and rear, to reduce the hostile strong point by enveloping action, prepare for a frontal attack. The aim should be to produce as large a volume of frontal and oblique fire as possible and under its protection to build up an assaulting line at close range to the hostile resistance.

(4) Opportunities to advance are often transient. Take immediate advantage of effective fire of artillery, accompanying weapons, and machine guns, or the flanking fire of adjacent platoons, to make a rush.

(5) Reinforcing a platoon which is held up does not necessarily mean thickening the line; assistance may often be more effectively given from a flank. It is always the duty of the leader to acquaint himself with the situation by personal reconnaissance before committing his platoon to any line of action.

(6) Cooperate and keep in touch with the platoons on either flank, and be on the lookout to assist them. The circumstances of the situation will determine whether this can best be done by delivering flanking fire across their front or by continuing the advance. When it is possible to outflank the hostile resistance, assistance may often be more effectively rendered by pushing ahead than by directly supporting a platoon held up; the surest means of helping a neighbor in battle is to push on.

711. The rôle of the platoon and section leaders consists in combining fire with movement. The advance is made in one body if

under cover, at quick time; if in the open and exposed to fire by smaller elements employing short rushes at full speed. These can also advance by filtering over ground furnishing but little cover.

712. More attacks fail from loss of direction than from any other cause. Every platoon leader must practice himself and his section leaders in the use of the compass, selecting points such as a tree or other conspicuous object as a direction point and reconnoitering before movement whenever possible. Platoons must be practiced in crossing long stretches of ground without losing the direction of march or connection with adjacent units.

Approach March.

713. The infantry advancing to the attack from the point where it first comes under artillery fire to its first firing position is concerned with only one question, "To reach that firing position with a minimum loss of life." In general, small columns permit better utilization of the terrain and are more easy to maneuver than skirmish lines. Hence, under artillery fire only, the platoon may be formed in any of the following formations:

Echeloned section columns:

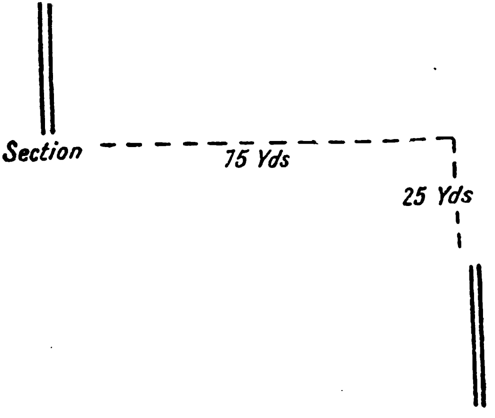


FIG. 5.

Line of section columns:

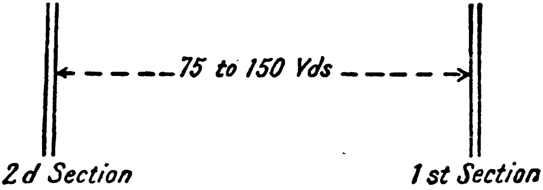


FIG. 6.

Echeloned squad columns:

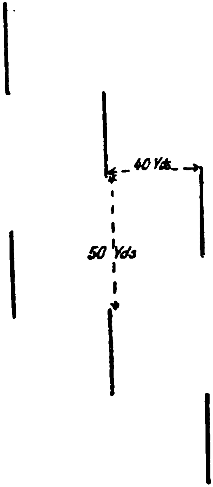


FIG. 7.

Line of squad columns:

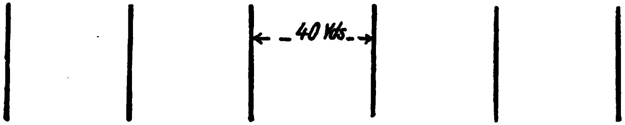


Fig. 8.

Line of squad columns in two waves:

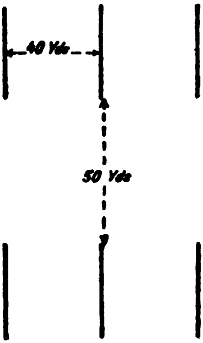


Fig. 9.

Deployment.

714. The platoon most frequently deploys in two waves, each wave comprising one section.

The functions of the rear wave are:

(a) In the assault of trenches, to strengthen the first wave in any hand-to-hand combat that may arise in the hostile position immediately after launching the assault. To carry out this mission and to be able to debouch from the departure position before the hostile barrage comes down, it must follow closely behind the leading wave (15 to 25 yards).

(b) During more open operations, to serve as a unit of maneuver and reinforcement in the hands of the platoon leader; as such, it may be employed to envelop hostile resistance or to check counterattacks. The execution of these missions require that it be at a considerably greater distance from the leading wave than during the trench-to-trench attack (50 to 150 yards).

Deployment on a wide front (two sections in line) decreases the ability of the platoon leader to control his platoon.

715. The platoon is in combat formation when it is able to open fire, either immediately without change of formation or after a simple and prescribed change. In the first case, it advances in line of skirmishers; in the second case, it advances in line of small columns (sections or squads), with sufficient intervals for deployment as skimishers.

These two formations may sometimes be combined. For instance, a platoon may have its leading section deployed in line of skirmishers and its rear section in line of squad columns at deploying intervals.

716. The formations of squads and sections are adapted to the terrain. One section or squad may be compelled in its advance to pass over a dangerous piece of ground in skirmish line, while the section or squads to the rear or flank advance in small columns in a ravine or behind a hill which hides them completely.

717. When it is impracticable to advance farther without firing, one or more waves are deployed as skirmishers. The following are examples of assault formations:

Suitable formation for an assaulting platoon advancing without the protection of a rolling barrage:

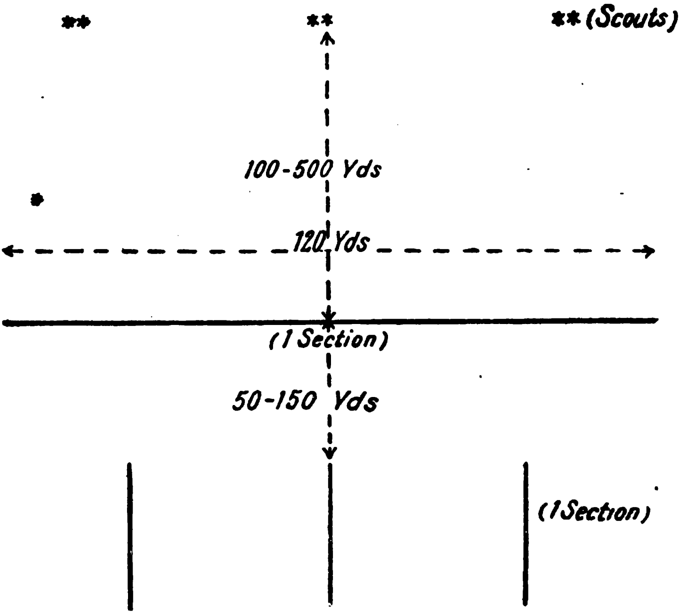


FIG. 10.

Suitable formation for an assaulting platoon advancing under protection of a rolling barrage:

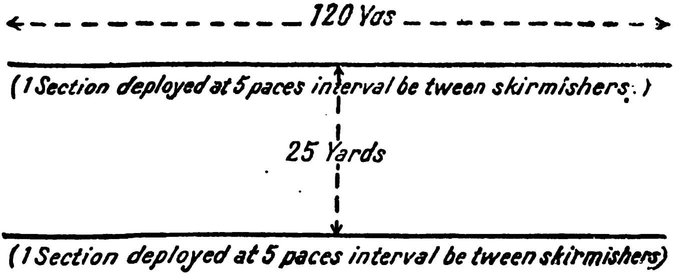

120 Yds
(1 Section deployed at 5 paces interval be tween skirmishers.)
25 Yards
(1 Section deployed at 5 paces interval be tween skirmishers)

FIG. 11.

Suitable formation for an assaulting platoon advancing without the protection of a rolling barrage and in very rugged, wooded, or difficult terrain:

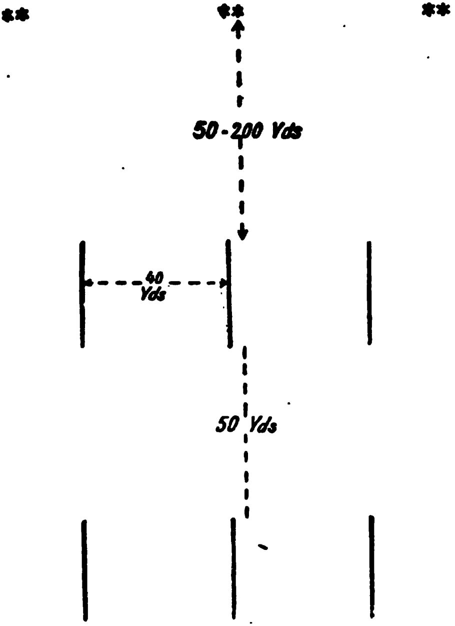


FIG. 12.

Advancing the Attack.

718. When closely following a moving barrage, there is seldom room for scouts. When the barrage has been lost or does not exist, as is ordinarily the case in the open field, scouts should precede the assaulting platoons. They should deploy in pairs at wide and irregular intervals, 10 to 50 yards, to present a poor target to hostile infantry and machine guns. They should take every possible advantage of the ground to obtain cover, provided their advance is not thereby unduly delayed, and cross exposed ground at a run. Their distance in front of the main bodies of their platoons follows no set rule but constantly varies with the ground and with the position of the enemy. One moment, they may be 500 yards ahead of their platoons; a few minutes later, they may be absorbed therein. Their purpose is to compel the enemy infantry and machine guns to open fire and so disclose their location. When the hostile machine guns or strong points have been located, the scouts should at once open fire. In each pair, one scout covers the advance of the other with his rifle.

719. The platoon, following the scouts, crosses open stretches at a run by successive rushes. Fire-swept areas may be crossed by the successive advance of individuals at widely separated intervals who work their way forward and re-form on a designated terrain line in advance.

The Fire Attack.

720. Under cover of the fire of the scouts, enough men from the platoon work forward individually or in small groups to the thin and irregular line of scouts in order to give it sufficient fire power to pin the enemy to the ground. If the scouts are in low ground, it will sometimes be advisable for the platoon to open fire over their heads from commanding ground in rear. But the firing line, however formed, must remain a thin one, with no two men ever less than five paces apart, and in the usual case preferably at much greater intervals. The first reenforcements for the scouts should contain one or more automatic rifle teams. At the same time, units of the second wave begin to work around one or both flanks of the first wave to get at the flanks of the strong point and thus close on its garrison. If the fire of the defense is shifted to meet the new attack, a whole or part of the first wave should take prompt advantage of the change in position or direction of fire to rush directly forward. Riflemen using rifle grenades assist the advance by heavy fire from suitable positions behind the first wave.

721. The ability of the platoon leader is displayed by prompt reconnaissance of the ground, by a rapid estimate of what it offers toward facilitating the advance of his men, and by immediate decision upon a simple plan for the use of his combined weapons and of ground to enable him to close with the enemy. His plan should habitually include pinning the enemy to the ground by frontal and flanking fire, under cover of which some portions of the

platoon, usually those sent against the hostile flanks, can close by short rushes with the enemy. The training and discipline of the platoon are shown by the skill with which the men carry out the plan of the leader.

722. Against a strong hostile resistance, the advance of the platoon at close range will generally be effected by successive rushes of fractions of the assaulting echelon. Enough weapons must continue in action to insure the success of each rush. Frequently the successive advances of the assaulting platoons must be effected by rushes of fractions of decreased size; that is, advance by rushes may first be made by section, and finally by squads or files; but no subsequent opportunity to increase the rate of advance, such as better cover or a decrease of the hostile fire, should be overlooked.

723. Whenever possible, the rush is begun by a flank fraction of the assaulting echelon. In the absence of express directions from the captain, each platoon leader determines when an advance by rushes shall be attempted.

The fractions need not be uniform in size; each platoon leader indicates how his platoon shall rush, having due regard to the ground and the state of the fire fight.

724. A fraction about to rush is sent forward when the remainder of the line is firing vigorously; otherwise the chief advantage of this method of advancing is lost.

The length of the rush will vary from 30 to 80 yards, depending upon the existence of cover, positions for firing, and the hostile fire.

725. As soon as a platoon or a section has overcome a hostile resistance, its leader re-forms it rapidly, and the advance is resumed. If it be impossible to advance for the time being, the ground must under no circumstances be abandoned. The dogged resistance of small elements, clinging to the ground, will in most cases check a hostile counterattack and allow the offensive to be resumed.

726. In addition to their mission of covering the advance of the platoon, the scouts constitute the advance elements of a filtration into a gap discovered in the hostile front; they should be followed as soon as possible by automatic riflemen and under the protection of their fire, a supporting point gradually built up on the enemy's flanks and rear.

727. When penetration is effected at isolated points, these must be constituted as supporting points from which hostile fire is kept down and the enemy's line rolled up toward the flanks; and as bases of departure for a further advance.

Position Warfare.

728. In a trench-to-trench attack, it is of special importance that every squad should be formed up square to its objective. The platoon leader must satisfy himself that tapes, flags, disks, or other means of indicating the method of forming up for the attack have been established, and that his section leaders understand, and have made their men understand, exactly what they have to do and how they are to advance.

729. The section in the first wave debouches from the departure trench or advances from the take-off tape at O hour (i. e., the designating hour for starting the attack) and moves on its objectives without stopping to search hostile shelters.

It is essential that the advancing line keep as close as possible to the creeping barrage, and that by the rapidity and the continuity of such advance, full advantage be taken of the surprise effect on the enemy. When the skirmishers meet an obstacle (such as a section of wire entanglements), they must move around it, making use of any passage that exists in the wire, trample it down, or cut a path through it.

730. When a section encounters hostile resistance, it endeavors to overcome it by combining movement and fire. The automatic rifles and the rifles fire on every exposed target and thus oblige the defenders to conceal themselves, while the hand and rifle grenades are used against objectives under cover. Rifle grenades are especially valuable for the latter purpose.

731. The second wave advances toward the objectives, preserving its distance from the first wave until the necessities of the combat demand its assistance. However, when the necessity does arise, the leader must, on his own initiative, engage his unit wholly or in part, for the following purposes:

(a) To take part in any hand-to-hand combats in which the first wave may be engaged.

(b) To fill gaps that occur in the assaulting lines.

(c) To cooperate in surrounding any local resistance which can not be reduced by the leading wave or by neighboring units which have been delayed in their advance.

732. Combat in trenches and communicating trenches is to be avoided by assaulting platoons so long as they have not reached their objectives. This combat is reserved for the cleaning-up units.

The training and tactical handling of such units is prescribed in the "Manual for the Drill and Tactics of Hand-Bombers and Rifle Grenadiers." Army confidential publication.

Sec. XI.—THE COMPANY.

733. The company is the smallest self-contained infantry unit, capable of sustained action and including in its organization the means of making good its own losses in combat.

Advance in Route Column.

734. During the advance of the battalion in route column before the attack, each captain constantly observes and reconnoiters the ground so that he will at all times be able to deploy or engage his company on correct lines when the march column is broken up.

Approach March.

735. After the extension of the battalion from route column and on approaching the zone of hostile artillery fire, the captain forms his company in a suitable approach formation or as directed by the bn. c. He assigns a distant direction point and the compass bearing of the advance in accordance with instructions of the bn. c., designates a base platoon, and insures that other platoons of his company conform to the movements of the base platoon during the approach. He insures conformity of the advance of his base platoon with that of the company designated as the base by the bn. c. If his company is designated as the base by the bn. c., his base platoon is the base of the battalion; he insures its advance in the designated direction.

If the battalion enters the zone of hostile artillery fire prior to extension, each captain forms his company in approach formation on his own initiative.

736. During the approach march, all covered lines of advance are so utilized that only indistinct and fleeting targets are presented to artillery fire. Companies vary their intervals or form columns of slight frontage (files or twos) in order to take advantage of favorable approaches.

737. Where the nature of the combat formation of the company can be foreseen, the platoons are disposed in echelons corresponding to the echelons in which they will be formed for attack, and the advance is so directed that they will find themselves directly behind the positions on which they will deploy for combat. If on the other hand the situation is obscure, they are so disposed that a change of formation can be readily made, i. e., in depth or in echelon.

738. During the approach march, the c. c. moves to points from which he can obtain the best available views and thus anticipate the course of action, without, however, losing control over his company. The platoon runners insure visual connection between the c. c. and the platoon leaders when he leaves his company for purposes of reconnaissance. Company runners and buglers maintain communication with adjacent companies and with the bn. c. during all stages of the advance and of combat. Runners or other specially detailed men also serve as observers; designated men observe the progress of events on each flank and keep the c. c. constantly informed as to the location of adjacent units. Runners are trained to perform these duties automatically.

When danger of serious losses arises, the c. c. should be with his company.

739. C. cs. take the necessary measures for security and reconnaissance. When the advance is not covered by other troops, the leading companies cover their advance by scouts. These deal with any resistance encountered from hostile advanced posts and patrols. C. cs. reinforce them when necessary with elements from their companies and rapidly clean up the hostile points of resistance without, however, permitting the advance of their companies to be unduly delayed.

Deployment.

740. In some cases the position selected by the bn. c. for the formation of the battalion for attack will be the same as that at which it is extended in approach formation. In such case, the c. c. will conduct his company to a point at which it can be formed for combat and objectives assigned to platoons. Wherever possible, however, the bn. c. will direct the approach march to the most advanced position from which the attack can be launched under cover prior to entering the zone of effective small-arms fire.

741. Upon receiving his orders for combat, the c. c. of an assaulting company engages his company by verbal orders to his platoon leaders. He gives them the information obtained by reconnaissance concerning the enemy and all available information regarding adjacent units and our own artillery; assigns each platoon a combat mission; prescribes the formation; designates a base platoon and, when practicable, a distant direction point and compass bearing; states the location of the combat train, the battalion aid station, and his own combat post. Where time is available, more detailed orders may be issued in accordance with paragraph 595.

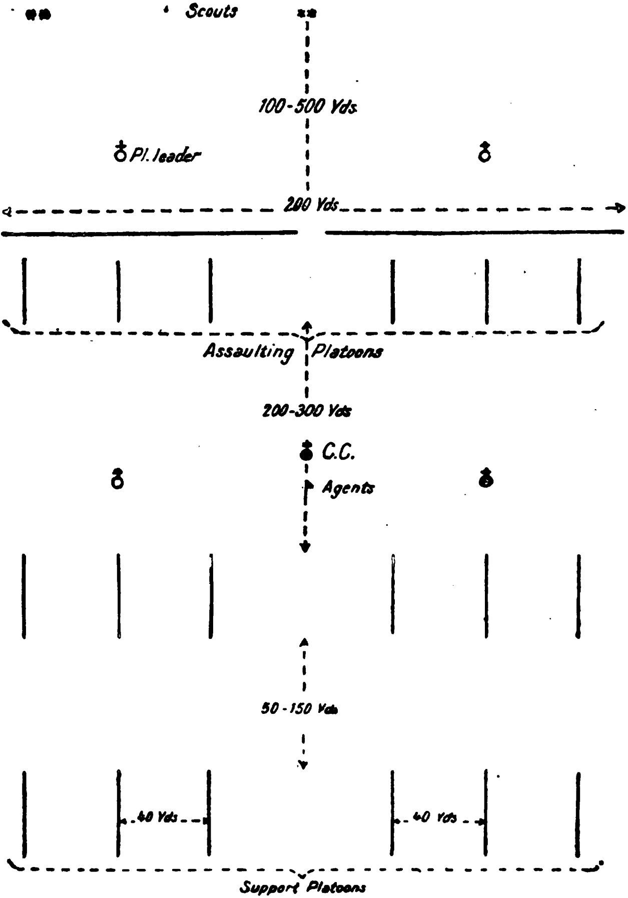

Scouts
100-500 Yds
Pl. leader
200 Yds
Assaulting Platoons
200-300 Yds
C.C.
Agents
50-150 Yds
40 Yds
40 Yds
Support Platoons

FIG. 13.

742. The company may deploy with one, two, or three platoon(s) in the assaulting echelon, and three, two, one platoon(s) in support, depending on the frontage assigned to the company and the information available as to the enemy's dispositions. Exceptionally, all four platoons may be placed in the assaulting echelon.

743. It will not always be possible to formulate a complete attack order at any particular time. Frequently the order will be made up of a series of partial orders given out in the course of the advance as the situation develops. Incompleteness of orders should not lead to hesitant action on the part of platoon leaders; if they have no other indication than the direction of the advance, they are able to press forward in the assigned direction in contact with the base platoon and deal with situations as they arise on their own judgment and initiative. Obscurity in the situation is met, not by hesitant action, but by sufficient depth of dispositions to meet unexpected developments, by protecting the flanks by echelonment and by the use of scouts.

Advancing the Attack.

744. Ordinarily fire is opened on orders of the platoon leaders. C. cs. may, however, reserve to themselves the moment of opening fire.

745. The position of the c. c. of an assaulting company prior to opening fire is usually with his assaulting platoons. When practicable, he regulates the distribution of the fire of the platoons at the first firing position.

746. The formation in small columns should generally be continued by the assaulting platoons until, in order to advance, they are compelled to reply to the enemy's fire. The company then assumes a combat formation.

The Fire Attack.

747. The significance of the designation of the base platoon ceases as soon as the fire fight commences. Each platoon advances as rapidly as the circumstances of the fight in its front permit.

748. Leaders of assaulting platoons advance the attack by mutual fire support and alternate fire and movement. The c. c. intervenes whenever he judges necessary. His principal duties are:

(a) To reinforce the assaulting platoons whenever they become depleted in strength, and to forward ammunition to them, when necessary, with the reinforcements.

(b) To maneuver his support platoons so as to outflank or envelope any resistance holding up the advance of the assaulting echelon.

(c) To make the necessary dispositions to protect the flanks of the assaulting platoons against counterattack.

(d) To prevent the support platoons from merging themselves into the assaulting echelon and to keep them under the nearest available cover when not advancing; during progression, to select successive positions for the supports prior to departure from the preceding position (advance by bounds).

(e) To insure mutual support of his platoons and lend support to adjacent companies.

The position of the c. c. is where he can best carry out these missions. Usually he is with the support platoons or between them and the assaulting echelon. He must at all times be at a point from which he can observe the action of the assaulting echelon. When the supports have been entirely absorbed in the assaulting echelon, he joins that part of the line from which he can best control the advance of his company.

749. The distance of the support platoons from the assaulting echelon is dependent on the situation and the terrain. They must at all times be close enough to the assaulting platoons to be able to effect a timely reinforcement. In general, they should follow the assaulting echelon as closely as cover and the possibility of movement toward a flank will permit.

750. A reinforcement sent to the assaulting echelon joins it deployed as skirmishers. The leader of the reinforcement places it on the flank of the assaulting echelon or in an interval in the line, if one exists, and commands it thereafter as a unit. If this method of reinforcement is impracticable, the reinforcing fraction is advanced with increased intervals between skirmishers; each man occupies the nearest interval in the assaulting echelon and each then obeys the orders of the nearest squad and platoon leader.

751. A reinforcement joins the assaulting echelon as quickly as possible without exhausting the men. Their movement should be similar to that of a group executing a rush.

752. The original platoon division of the companies in the assaulting echelon should be maintained and should not be broken up by the mingling of reinforcements.

Upon joining the assaulting echelon, officers and petty officers accompanying a reinforcement take over the duties of others of like grade who have been disabled or distribute themselves so as best to exercise their normal functions. Conditions will vary, and no rules can be prescribed. It is essential that all assist in mastering the increasing difficulties of control.

The reinforcing of the assaulting echelon by driblets of a squad of a few men has no appreciable effect. The assaulting echelon requires either no reinforcement or a strong one. Generally, a section or a platoon will be sent forward under cover of a heavy fire of the assaulting echelon.

753. As soon as he loses contact with the enemy, the captain reestablishes it by the further advance of the combat line. In covered ground, the advance is preceded by scouts or patrols whose mission is to prevent surprise. The c. c. keeps the bn. c. in touch with the situation and sees that the location of the line is indicated as prescribed or when an aviator requests it.

The Assault.

754. The c. c. rapidly organizes his company for assault when his assaulting echelon or a considerable portion of it is held up in front of a local hostile resistance. When his arrangements have been completed, he gives the command or signal to change. The officers lead the charge. The skirmishers spring forward shouting, run with the bayonets at charge, and close with the enemy.

After a successful assault, the c. c. immediately takes steps for the reorganization of the assaulting units. Any available support platoons are immediately started in pursuit, taking over the rôle of the assaulting echelon. By rapid entrance into action of the supports the development of a hostile counterattack will be prevented and the defeated troops thrown back upon their reserves, masking their fire and spreading disorder among them. All commanders at once take steps to form temporary groups from the assaulting elements and combine them into larger temporary units.

Organization of the Ground.

755. When the advance is definitely stopped, the c. c. establishes his front line and line of resistance as directed by the bn. c. and constitutes the area assigned to his company as a strong point. In absence of directions, he acts on his own initiative. He provides for defense in depth, reestablishes contact with adjacent units and the rear, assigns areas of defense and sectors of fire to his platoons, and arranges for their mutual support by flanking fire. He makes report of his dispositions (sketch) to the bn. c.

Within the shortest possible time, measures should be taken to protect the front with such accessory defenses as can be laid rapidly, and fire and communicating trenches should be dug.

Efforts to secure locations giving good views of the enemy's positions are of the highest importance. Flanking observation is particularly important.

Reserve Companies.

756. The c. c. marches ahead of his company and as close as possible to the bn. c. His constant effort must be to cover the flanks of the preceding companies. He also rallies, when necessary, the supports of these companies.

In emergencies, he must not hesitate to act, and he must do so without waiting for orders—such necessities might be, for example, to cover a flank or to stop a counterattack. Constant personal reconnaissance by c. cs. of reserve companies is therefore necessary in order that they may be able to act with knowledge of the situation when the occasion requires. Close contact with the preceding companies must be assured.

Care must be taken to prevent the merging of the reserve companies with the assaulting companies; c. cs. of reserve companies must therefore be familiar at all times with the location of assaulting companies.

757. Before moving their companies from any position during the advance, c. cs. of reserve companies must select an advanced position and decide on the method of advance thereto unless the new position has been designated by the bn. c. In order that this may be accomplished without delaying the progression, c. cs. must constantly reconnoiter the ground to their front.

The Company Acting Alone.

758. In general, the company, when acting alone, is employed according to the principles applicable to the battalion acting alone; the c. c. employs platoons as the bn. c. employs companies, making due allowance for the difference in strength.

759. The company must be well protected against surprise. Combat patrols on the flanks are specially important. Each leader of a flank platoon details a man to watch for the signals of the patrol or patrols on his flank.

Position Warfare.

760. Company assault formation in position warfare, the company advancing under the protection of a rolling barrage:

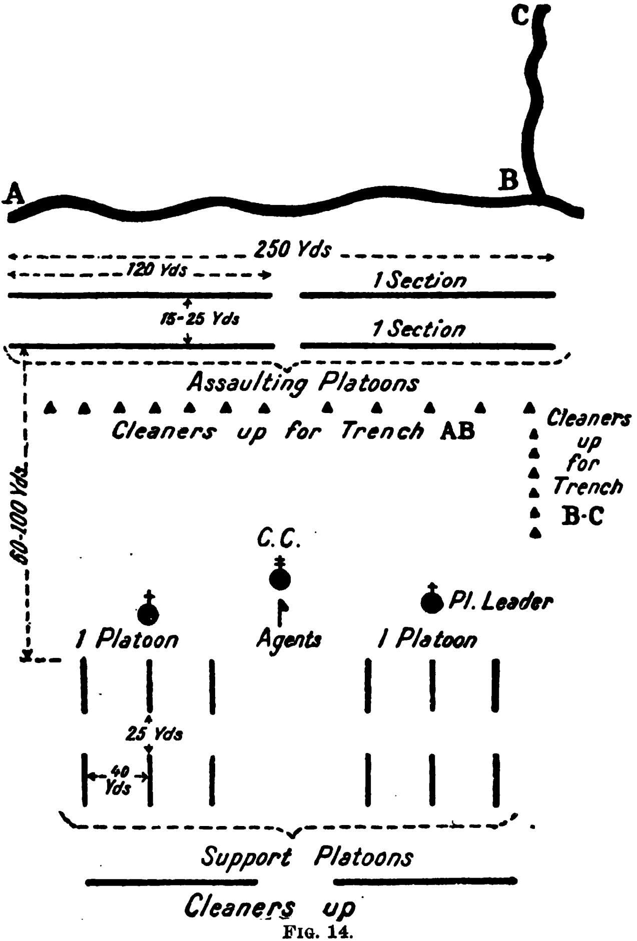


FIG. 14.

NOTE.—Formation varied to meet requirements of situation.

Sec. XII.—THE BATTALION.

761. The battalion is the attack unit whether operating alone or as part of a larger unit. It generally attacks as a mixed unit, comprising not only infantry companies but also all the accompanying weapons of the infantry regiment and accompanying artillery.

Advance in Route Column.

762. The battalion advances in column of route until the situation requires its extension. The time of extension should be so selected that the battalion does not enter the zone of hostile fire in close formation but on the other hand avoids useless detours and premature abandonment of the route of march.

763. The bn. c. directs the necessary reconnaissance to locate areas under hostile shell fire and determines the point at which the extension of the battalion will become necessary. He details the necessary covering detachments to protect the advance of the battalion and develops the enemy's position in his zone of attack.

The covering detachment deals with any hostile patrols and advanced posts which have not been cleaned up by the covering detachments of the larger units (regiment, brigade, or division), or which have succeeded in passing through them. The bn. c. maintains close touch with the covering detachment by means of orderlies or runners. The strength of the detachment will be increased when the front is not covered by detachments from the higher units.

764. In some cases, as in a rapid pursuit, the advance may be covered by an advance guard company which advances on a broad front and endeavors to hold the enemy fast by its fire while other companies, designated by the bn. c., move forward and execute outflanking movements. In the attack of an enemy in position, however, the function of the covering detachment is limited to securing the march of the battalion and developing the enemy's position; the bn. c. will endeavor to retain in his own hands the power of engaging his companies according to a definite plan of action and not allow them to become involved in a planless action initiated by advance detachments.

Throughout the advance into action, the bn. c. is at the head or in advance of his leading company.

765. The combat train of the battalion ordinarily follows the battalion during the advance into action. Prior to extending his battalion, the bn. c. will cause extra ammunition to be issued from the combat train and direct the emptied wagons to proceed to the rendezvous designated by the regimental commander to be refilled.

Approach March.

766. In extending his battalion, the bn. c. assigns the direction of the advance, designates the base company, and prescribes the formation. As a rule, the battalion extends on the leading company. The extension is generally best effected by changes of direction of the heads of the companies.

767. The formation to be taken will depend upon the situation at the time of extension. If sufficient information is available, the companies may be formed in echelons corresponding to the echelons in which they will deploy for attack. Otherwise, they are disposed in a formation affording maximum security against loss and adapted to forming for attack in any direction. If the flanks are not protected by other units, a formation in which the flanks of the battalion are echeloned to the rear is generally most effective (for example, one company in advance, one company to the right rear and one company to the left rear of the leading company, one company in rear of the center of the three leading companies).

768. After extension of the battalion and before coming within range of the enemy's guns, the battalion marches toward its successive direction points in the zone of advance assigned to it, in an approach formation adapted to the terrain. This formation may be similar to that shown in Figure 15, except that the leading echelon will be formed in small columns and the position of the bn. c. will be at the head or in advance, of the battalion. Distances and intervals are increased when crossing ridges and other prominent terrain lines which can not be avoided. At times, it may be advisable to cross particularly dangerous lines (roads, crests, embankments) by surprise and whole companies at a time; the units take care not to debouch from cover at the same point. Or, the line may be crossed by successive rushes of individuals widely separated who re-form on a designated line in advance.

Temporary variations in distances and intervals required by the terrain or the situation are made by company commanders on their own initiative.

769. The bn. c. conducts constant personal reconnaissance with a view to locating areas swept by hostile shell fire. Whenever

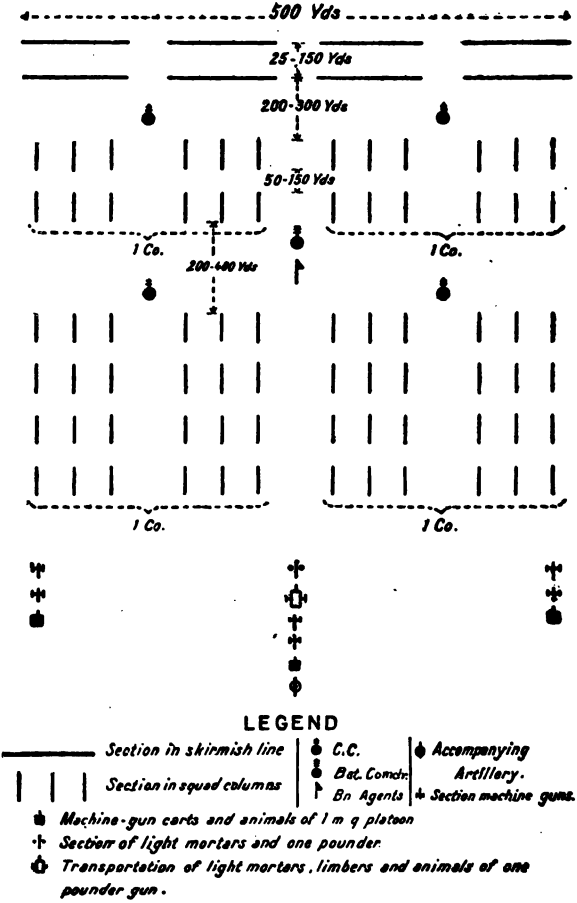

500 Yds
25-150 Yds
200-300 Yds
50-150 Yds
1 Co.
1 Co.
200-400 Yds
1 Co.
1 Co.
LEGEND
Section in skirmish line
Section in squad columns
C.C.
Bat. Comdr.
Bn Agents
Accompanying Artillery.
Section machine guns.
Machine-gun carts and animals of 1 m g platoon
Section of light mortars and one pounder.
Transportation of light mortars, limbers and animals of one pounder gun.

FIG. 15.

practicable, such areas are avoided. Signalmen and runners maintain connection between the bn. c. and his message center when he leaves the battalion for purposes of reconnaissance. They also maintain communication with the rg. c., the companies, and adjacent units, under the supervision of the liaison officer, throughout all stages of the advance and of combat.

770. The bn. c. regulates the advance of his battalion by the assignment of successive direction points or compass bearings to his base company. Where practicable, changes in the direction of the advance are communicated to other companies.

Deployment.

771. In some cases, the bn. c. may assign complete or partial attack missions to his companies before extension of the battalion in approach formation. Usually, however, he will aim to direct the approach march of his battalion to the most advanced position at which it can be formed for combat under cover prior to entering the zone of effective small arms fire, before issuing his attack order. The place chosen for the formation of the battalion should afford cover from view, and if possible, from aerial observation.

772. The bn. c. engages his units by verbal orders to the commanders, assembling them for that purpose when practicable. He gives them the information obtained by reconnaissance relative to the enemy and all available information relative to adjacent units and our own artillery, assigns each unit a combat mission, prescribes the formation and gives the location of the combat train, the battalion aid station, and his own combat post. Where time for the organization of the attack is available he may prepare more detailed written orders in the form described in paragraph 595.

773. The battalion deploys with one, two, or three companies in the assaulting echelon and three, two, or one companies in reserve. Exceptionally, as in a meeting engagement, all four companies may be placed in the assaulting echelon. Such a deployment causes early mingling of the larger units, rendering leadership and control difficult. The deployment with one company in the assaulting echelon and three in reserve is a form of advance-guard formation, the leading company functioning as a reconnoitering and containing unit. The disposition with two companies in the assaulting echelon and two in reserve gives a uniform deployment in depth and frontage and is especially adapted to meeting counter-attack from any direction and to a uniform progression of the attack. Depth is required for an attack which seeks a decision; extension in width for a containing engagement or demonstration.

In general, the number of companies assigned to the assaulting echelon will depend on the frontage assigned to the battalion and the situation. The more obscure the situation, the greater the strength of the reserve. The number of assaulting companies will frequently be determinable from the regimental commanders order; the remainder constitutes the reserve.

774. The battalion usually employs a patrol (platoon, section, squad), supported by machine guns, the mission of which is:

(a) To cover the interval between the battalion and neighboring units.

(b) To protect the flank of the battalion in case the neighboring battalion is checked in its advance.

(c) To bring oblique or enfilade fire against elements of the defense holding up the advance of the neighboring battalion.

This patrol marches, as a rule, on the flank of the battalion and abreast of the reserve companies.

It will sometimes be advisable to form the patrol as a mixed detachment composed of elements from two adjacent battalions.

775. The position of machine guns, light mortars, one-pounder guns, and accompanying guns as shown in Fig. 15, is that ordinarily taken when an early action of these weapons appears improbable or the terrain is unsuitable for their use.

During the advance, the center machine-gun platoon will normally be used only for antiaircraft work. For this purpose a petty officer and one private per gun will be sufficient to operate the gun. This permits a petty officer and 14 privates to be detached to each of the flank platoons as carriers. When the flank platoons advance their guns by hand, these attached petty officers are responsible for the progress of the carts.

The position of the machine guns, light mortars, one-pounder guns, and accompanying guns shown in Fig. 16, is that ordinarily taken when an early action appears probable and the terrain is suitable for their use.

Advancing the Attack.

776. If his battalion be one of several in the first line, the bn. c., in executing his part of the attack, pushes his battalion forward as vigorously as possible within the front, or section, assigned to it. The great degree of independence allowed to him as to details demands, in turn, the exercise of good judgment on his part. Better leadership, better troops, inequality in the hostile resistance, and more favorable terrain enable one battalion to advance more rapidly in attack than another less fortunate, and such a battalion will insure the further advance of the others.

The Fire Attack.

777. During this phase, the advance of the assaulting companies is mainly in the hands of the assaulting company, platoon, section, and squad commanders, who advance the attack by mutual fire support and alternate fire and movement. The bn. c. intervenes when necessary to push forward companies who hesitate and to insure the necessary cooperation between companies when this is lacking.

In principle the rôle of the bn. c. is:

(a) To employ accompanying weapons and machine guns in support of the advance of assaulting companies.

(b) To maneuver his reserve companies so as to envelop hostile resistances or cover gaps arising between assaulting companies.

(c) To reenforce assaulting companies when they become depleted in strength.

(d) To forward ammunition to the company supports by carrying parties or with reenforcements.

(e) To take the necessary action to protect the flanks of the battalion or of adjacent units against counterattack.

(f) To prevent reserve companies from emerging themselves into the first line and keep them under the best available cover within supporting distance of the assaulting companies when not advancing; during progression to select successive positions for the reserve prior to departure from the preceding position (advance by bounds).

(g) To select successive positions for the battalion ammunition point as the attack progresses and issue instructions at the proper time for the movement of the combat train to the point selected.

The danger of an uncontrolled merging of the battalion reserves with the assaulting companies is particularly to be guarded against when the combat line is checked in front of a hostile strong point, powerfully organized. In this case, reenforcement is generally ineffective, and an outflanking or enveloping movement is necessary.

The position of the bn. c. should be such that he can observe the progress of assaulting companies and control the action of reserve companies and accompanying weapons.

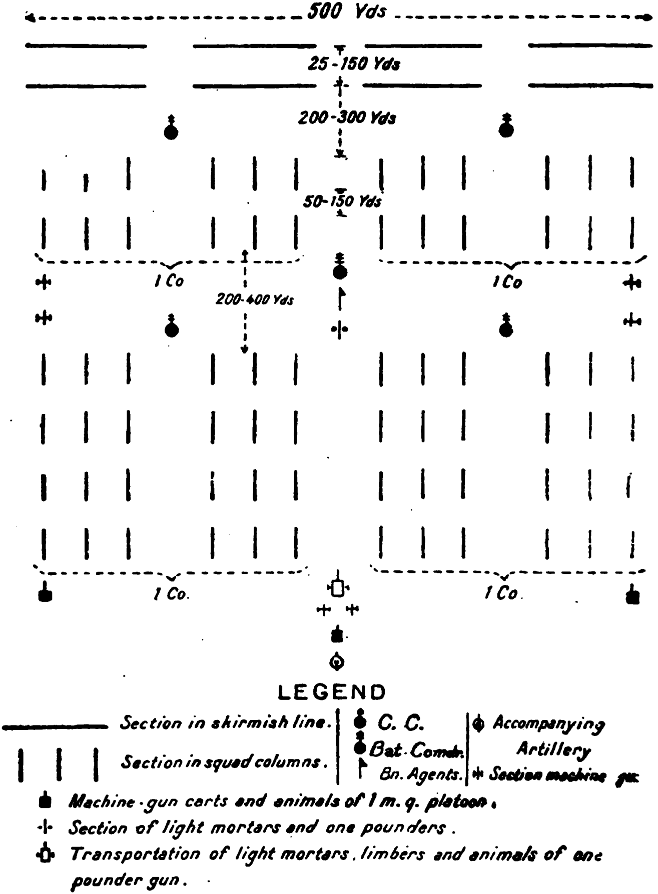

500 Yds
25 - 150 Yds
200 - 300 Yds
50 - 150 Yds
1 Co
1 Co
200-400 Yds
1 Co.
1 Co.
LEGEND
Section in skirmish line.
Section in squad columns.
C. C.
Bat. Comdr.
Bn. Agents.
Accompanying Artillery
Section machine gun
Machine-gun carts and animals of 1 m. g. platoon.
Section of light mortars and one pounders.
Transportation of light mortars, limbers and animals of one pounder gun.

FIG. 16.

778. The bn. c. must anticipate possible counterattacks and be able to detect and to check any menace against his flanks. It is the essential rôle of units not engaged to be able to act immediately in the threatened directions, especially the machine guns and light mortars, which follow the attack from one position to another. Dangerous localities must be especially watched.

The Assault.

779. The hostile position will frequently be reduced by a series of local assaults executed at different times by small units (squads, sections, platoons, companies).

It will sometimes happen, however, that the entire battalion is held up in front of a strong hostile resistance which can not be outflanked. In such case the bn. c. must arrange for a prepared assault with the support of artillery, machine guns, and accompanying weapons. He must either fix an hour for the delivery of the assault or employ a preconcerted signal for that purpose.

Under the cover of the supporting fire the assaulting units advance as close to the objective as possible, and when the preparatory fire ceases or is lifted from the objective charge the hostile resistance in a single rush.

After the assault it will frequently be necessary to reorganize the assaulting companies and to continue the advance with the reserves, who then take over the rôle of the assaulting echelon.

Organization of the Ground.

780. When the advance is definitely stopped and can make no further progress, the bn. c. must organize the ground for defense. During the day the dispositions made will relate chiefly to reserve companies; the assaulting troops will have to dig in wherever they find themselves. At night the battalion commander should complete the organization for defense by—

(a) Establishing his front line at least 200 or 300 yards from the enemy position, leaving small security detachments in front of it.

(b) Establishing a line of resistance.

(c) Assigning to companies sectors of fire and areas of defense which will constitute strong points capable of all around defense and mutually flanking each other.

(d) Disposing his machine guns so as to flank the front and cover the flanks.

(e) Assigning to certain units the mission of counter attack.

Prompt information as to his dispositions should be forwarded to the regimental commander and the artillery.

The Machine-Gun Company.

781. Every assaulting battalion is reinforced by a machine-gun company, which reports to and is under the orders of the battalion commander. The company ordinarily works by platoons, one platoon supporting each assaulting company.

782. The commander of the machine-gun company retains command of his entire company; the assignment of platoons to support assaulting companies does not imply a transfer of command over such platoons to the rifle company commanders.

783. If only two rifle companies are in the assaulting echelon, one platoon of the machine-gun company is assigned the missions of antiaircraft defense, security of the flanks of the battalion, and furnishing replacements for the first-line platoons.

784. At the beginning of an attack the machine-gun platoons will at first usually follow in rear of the assaulting companies, provided the character of the terrain renders their early use probable. Otherwise, they follow in rear of the reserve companies.

785. After the enemy has been located the guns of each platoon habitually work in pairs, one pair remaining in position on commanding ground to cover the advance of the other pair to a suitable firing position in advance. All changes of position are as a rule by echelons of half platoons. Except in the early stages of the attack, a steady advance of machine guns will seldom be advisable.

786. A platoon supporting the advance of an infantry company ordinarily fires from commanding positions over the heads of the troops.

787. The machine-gun company commander remains near the battalion commander. He takes full advantage of every opportunity to concentrate the fire of his platoons, usually without changing their position, on those hostile nests or strong points which are making most trouble. He shifts the fire of his platoons whenever practicable to give flanking instead of direct fire. He must take advantage of every opportunity to bring forward his machine gun and ammunition carts.

788. Platoons in support of assaulting companies should send forward agents, usually a p. o. and two privates, to the rifle companies.

Fire from the supporting machine guns will, as a rule, most promptly be secured by a rocket signal.

789. While machine-gun commanders must carry out the missions assigned them by battalion commanders, they must not place a narrow interpretation on them. They must frequently act on their own initiative in order to take prompt advantage of fleeting opportunities. To meet this requirement constant touch with the situation by reconnaissance to the front and flanks is indispensable.

One-Pounders and Light Mortars.

790. For an attack, these weapons are best organized into sections, each consisting of a one-pounder gun and a light mortar under command of a section leader.

One or more sections are usually assigned to each attacking battalion; when more than one section is so assigned, the sections are united into a group. The section or group commander reports to and is under the orders of the battalion commander.

791. The one-pounder and the light mortar are used to prepare and follow up the attack, to break any resistance which develops in the course of the advance, and to cooperate in the occupation of a conquered position. During the advance, their principal mission is the destruction of machine guns and machine-gun nests. The one-pounder should not as a rule be used against other targets than machine guns or tanks.

792. The section or group advances by bounds from one firing position to another along well defiladed routes which should be reconnoitered in advance.

793. Reconnaissance of objectives encountered during the advance will determine which weapon can be most effectively employed against them. If the reconnaissance develops a plainly visible target, the one-pounder gun should be used; if on the contrary the exact location of the target can not be determined but only the area within which the target must lie, the fire of the light mortar should be applied.

794. The section or group commander must maintain constant touch with the situation and battalion commander. The battalion commander must direct the reconnaissance of the section or group commander and by his own personal reconnaissance exploit every opportunity which the situation offers for the effective employment of these weapons in support of the attack. Group and section com-

manders must frequently act on their own initiative to take timely advantage of fleeting opportunities.

795. In position warfare the one-pounder gun is installed before the assault in an emplacement from which it can efficiently serve the following purposes:

Demolish machine-gun positions which may show themselves at the last minute;

Sweep those parts of the hostile position which are dangerous for the flanks of the attack;

Fire upon the rear defensive lines.

To prevent its destruction, it is advisable to put it into action only at the last moment.

Any use made of the gun prior to the attack must not interfere with its advance with the battalion to which it is assigned.

Ammunition Supply.

796. The method of supply of ammunition to the combat trains must be worked out in advance, if possible, for each occasion of landing, the local conditions being fully considered.

797. The extra ammunition of a battalion going into action is carried in its combat train. Ammunition is issued from the combat train prior to the formation of the battalion for action.

798. The combat train is the immediate reserve supply of the battalion, and the bn. c. is responsible for its proper use. He will take measures to insure the maintenance of the prescribed allowance all times.

799. The combat train includes all personnel, vehicles, and animals attached to the battalion and the units accompanying it in action for transporting ammunition reserve and special equipment required during combat, including the medical cart or mule. The rolling kitchens and water carts are usually attached to the combat train.

In the absence of instructions, he will cause the train to march immediately in rear of his battalion, and, upon separating from it to enter an engagement, will cause the ammunition therein to be issued.

800. The point at which the combat wagons are emptied is established as the initial ammunition point of the battalion under charge of the munitions officer of the battalion. The emptied wagons are returned to the ammunition-distributing point designated by the regimental commander to be refilled. Ordinarily a rendezvous is appointed for each brigade and the necessary number of wagons sent forward to it from the ammunition column.

801. When refilled, the combat wagons will rejoin their battalions, or if the latter be engaged, will join or establish communication with the regimental reserve.

802. In maintaining the ammunition supply of the battalion during action, ammunition is pushed forward as far as possible by wagon; then if practicable by cart or pack mule; and finally by carriers or reenforcements. Subject to this general principle, the following may be taken as the basis for the organization of the chain of ammunition supply in action:

(a) From the distributing point designated by the regimental commander to the battalion ammunition point: Transportation by the combat wagons of the battalion;

(b) From the battalion ammunition point to the battalion reserve: Carts, pack mules, or carriers (preference in the order stated, according to the situation);

(c) From the battalion reserve to the company supports: Carrying parties;

(d) From the company supports to the assaulting echelon: Reenforcements.

803. Company commanders are responsible that the belts of the men in their companies are kept filled at all times except when the ammunition is being expended in action. In the firing line the ammunition of the dead and wounded should be secured whenever practicable.

804. Ammunition in the bandoleers will ordinarily be expended first. Thirty rounds in the right pocket section of the belt will be held as a reserve, to be expended only when ordered by an officer.

Men will never be sent back from the firing line for ammunition. Men sent forward with ammunition remain with the firing line.

At night it will generally be possible to move the ammunition farther forward by the combat wagons and bring it to the assaulting echelon by carriers.

805. Carrying parties should when practicable be detailed from the regimental reserve and attached to assaulting battalions in accordance with necessities.

806. When the ammunition point is displaced as the attack progresses, an agent should be left at the old ammunition point to direct vehicles to the new location.

807. As soon as possible after an engagement the belts of the men and the combat wagons are resupplied to their normal capacities. Ammunition which can not be reloaded on combat wagons will be piled up in a convenient place and left under guard.

Reserve Battalions.

808. Reserve battalions advance in approach formation according to the principles set forth for the advance of the assaulting battalions. As a rule the detail of covering detachments to protect their advance will not be necessary, provided contact with units toward the front and flanks is maintained.

809. Reserve battalions conform to the movement of assaulting battalions and cover their flanks, especially with machine guns. The bn. c. maintain close touch with the bn. c. of assaulting battalions whom they may be called on to support and with neighboring units. They keep themselves constantly informed as to the situation in order that they may intervene effectively when their support is called for.

810. Bn. cs. conduct constant reconnaissance of the ground to their front during the advance with a view to locating successive positions for their battalions in their forward movement in support of the attack. They move their battalions from one position to another as directed by the rg. c. or in accordance with general instructions issued by him.

811. During the attack a reserve battalion advances in approach formation always ready to intervene. It may be engaged either on the flanks of the assaulting battalion or by executing a passage of lines through the assaulting battalion. In the latter case it relieves the original assaulting battalion and takes over the rôle of assault.

812. When a battalion executes a passage of lines, it begins by halting in the same formation as the battalion that it has to pass. It re-forms on the base company designated and advances in small columns until its leading elements reach the advance elements of the preceding battalion.

The battalion commander causes appropriate signals to be given when the movement has been completed. The leading echelon deploys as soon as it has passed the line of the assaulting battalion.

813. The passage of lines creates a critical moment during which the density of the waves is doubled or at least very much increased. In consequence, the duration of this period must be reduced to a minimum. This demands that the beginning of the passage of lines should precede the hour set for the resumption of the offensive only by the period required for the execution of the passage. When the advance is to be preceded by a creeping barrage, a few minutes must be allowed in order to make sure that the passage executed by the assaulting echelon shall not be completed before the barrage resumes its advance. The necessity for coordinating the advance of the barrage and that of the infantry is of prime importance.

814. At the commencement of the assault in position warfare, a reserve battalion in second line follows close on the heels of the assaulting battalion so as to escape the hostile barrage; it gains the necessary distance from the assaulting battalion on entering the hostile position.

Position Warfare.

815. The cleaning up of captured positions is an extremely important operation which must be executed with method and rapidity. As a rule, cleaning-up units are not taken from the assaulting companies. Exceptionally, they may be taken from the battalion reserve companies. In the general case, they should be detailed from the regimental reserve. The battalion commander determines the assignment and duties of the cleaning-up units placed at his disposal by the rg. c. or taken from his battalion. He assigns to each one of them certain dugouts, trenches, and communicating trenches, and determines the new mission that will arise when these units have completed their duties. Several units are kept in reserve to be used against dugouts which have escaped notice.

816. Cleaning-up units may be divided between the first and second echelons, advancing behind them; or all may follow the second echelon.

817. The mission of cleaning up the trenches, shelters, and dugouts passed by the assaulting waves falls to tactical fractions of variable strength. These units may vary in strength from a section to a battalion, according to the available information as to the enemy's dispositions.

818. Cleaning-up units will sometimes have to undergo hard fighting; certain of them may have to content themselves with immobilizing the points of resistance which the commander has decided to have the assaulting waves envelop and await the reduction of the resistance by the assaulting troops before commencing the operation of cleaning up. It is advisable to give members of cleaning-up units a special insignia (arm band).

Sec. XIII.—THE REGIMENT.

819. The regiment constitutes the complete tactical and administrative infantry unit. It disposes not only of infantry battalions, but also of all auxiliary infantry weapons and of signal and pioneer units. It generally has direct control of a varying allotment of supporting artillery. It is self-contained in respect to supply, being equipped with the necessary transportation to insure replenishment.

Advance Into Action.

820. After having been assigned his mission by the brigade commander, the rg. c. conducts the advance of his regiment into action. He provides for the necessary covering detachments to develop the enemy's position and assign objectives or lines of advance to his battalions. The rg. c. is with the leading elements of his command.

Deployment.

821. The rg. c. engages his battalions by the assignment of combat missions to his available battalions, to which he allots the quota of accompanying weapons and machine guns necessary for carrying out these missions. He retains direct control over his reserve, infantry batteries attached to the regiment, the technical means of intercommunication, and the service of supply.

822. The regiment deploys for action with:

(a) Two battalions in the assaulting echelon and one in reserve,

(b) One battalion in the assaulting echelon and two in reserve; both of the reserve battalions may be at the disposition of the rg. c., or one battalion only, the other being held at the disposition of the brigade or divisional commander.

Exceptionally, all three battalions may be deployed abreast

The Attack.

823. Over open ground reserve battalions advance from cover to cover in approach formation as directed by the regimental, brigade, or divisional commanders, according as they are in regimental, brigade, or divisional reserve. They are held in readiness to guard against counterattacks, especially on flanks, to reinforce the assaulting battalions by extending the front, or to take in flank resistances holding up the advance of adjacent regiments. They are not employed, as a rule, without the order of the rg. c. or higher commanders.

824. Elements of reserve battalions may sometimes be placed at the disposition of assaulting battalions when the latter become depleted in strength. As a general rule, however, effort should be made to maintain the integrity of reserve battalions and to engage them as units. As the situation may require them to be put into action on very short notice, they should be constituted for combat on the same principles as assaulting battalions.

825. It is the especial duty of the rg. c. to employ his reserve battalions to support the attack, not only of his own assaulting battalions, but also that of less advanced neighboring units by taking in flank resistances holding out in their front or counterattacks directed against them. At critical junctures, the situation may require that he lead his reserve into action in person. He should at all times be close enough to his reserve to engage it in a timely manner.

826. During combat the rg. c. keeps in touch with the situation to his front and flanks by personal observation and reconnaissance or by means of special observation posts and patrols. He insures close support of the assaulting battalions by the artillery and directs the forward displacement of his infantry batterries (see paragraph 852–861) whenever the advance of the assaulting battalions renders it practicable. He maintains touch with his battalions, adjacent regiments, the supporting artillery, and the brigade commander.

Pursuit.

827. If the enemy withdraws in front of the regiment, the regimental commander directs the pursuit, forming his regiment in column of route, if out of effective range of hostile artillery, and detailing the necessary covering detachments. His post in the pursuit is with the leading elements of his command.

Organization of the Ground.

828. When the advance of the regiment is definitely held up and further progress is impossible, the regimental commander takes steps for the security of the regiment and the holding of the ground. When a strong hostile reaction, accompanied by a violent artillery preparation, is anticipated, he organizes his regiment in depth; according to the situation he disposes it over one or two positions. In the latter case, either in accordance with instructions of higher commanders or on his own initiative, he establishes an outpost zone and fixes its line of resistance, selects the main defensive position,

fixes its line of resistance, and assigns battalions to the outpost position, the main position, and the reserve. He arranges for artillery support of the outpost zone and the main position and disposes his machine guns so as to cover the front and flanks and the entire area between the outpost line of resistance and the main position.

When the regiment is disposed on one position only, two battalions will usually be placed in the first line and one in reserve.

Supply.

829. The rg. c. supervises and directs the service of supply of the regiment. He regulates the movement of the regimental trains between the distributing points of the regiment and the battalion ammunition and supply points or company kitchens. He supervises the issue of supplies at the distributing points and makes timely requisitions for supplies required.

Medical Service.

830. As the advance progresses, the medical personnel attached to assaulting battalions collects, dresses, and cares for the wounded at suitable collecting points under the best available cover. The regimental medical personnel takes over the wounded at the battalion collecting points, relieving the battalion personnel, which rejoins its unit; the regimental personnel also furnishes the necessary replacements to the battalion personnel.

During an advance, the regimental responsibility in respect to casualties consists in the collection, dressing, and care of the wounded prior to their evacuation by the divisional sanitary train. Except when acting alone, the regiment has no responsibility in respect to evacuation.

Prisoners.

831. Prisoners are turned over by assaulting battalions at collecting points designated by the regiment, which evacuates them as directed by higher commanders.

Pioneer Platoon.

832. During a steady progression, the pioneer platoon has few if any purely pioneer duties. It may sometimes be employed in assisting the advance of the accompanying weapons and other miscellaneous duties. During temporary periods of stabilization or when troops bivouac on the battle field at night, the pioneer platoon constructs temporary shelters for command posts, message centers, and observation posts. A certain proportion should be attached to battalions for this purpose.

Staff.

833. To assist him in the execution of his various tasks, the rg. c. has a tactical and administrative staff, comprising an operations officer, an intelligence officer, a liaison officer, an adjutant, a supply officer, and a medical officer. An artillery officer is usually attached for purposes of liaison with the artillery and as a technical advisor in artillery matters.

Sec. XIV.—THE BRIGADE.

834. The brigade is a purely tactical unit which has as its function to direct and coordinate the action of its component regiments and support their attack by use of its reserves, its machine-gun battalion, and attached artillery. The composition of the brigade is frequently temporarily altered by the attachment of varying quotas of auxiliary troops.

Advance into Action.

835. On deployment of the division, the brigade is assigned a zone of action, line of advance, or other mission. On receipt of his orders, the brigade commander conducts his brigade in column or in line of regiments until it becomes advisable to break it up into smaller columns. He makes the necessary provision for the reconnaissance of the brigade objective and precedes his command as far as possible in order to reconnoiter the ground personally and be prepared to issue his orders promptly.

Deployment.

836. In deploying his brigade, the brigade commander assigns to each regiment its zone of action, line of advance, or other mission. He provides for tactical liaison with adjacent brigades by the detail of strong combat patrols to which machine guns should be attached.

837. The brigade is usually deployed with the two regiments abreast. When the two brigades of the division are deployed abreast, one battalion of one regiment will usually constitute the brigade reserve and one battalion of the other regiment will usually be in divisional reserve.

When the division is deployed in column of brigades, the brigade reserve only is furnished by the first-line regiments.

838. The brigade commander usually assigns to each regiment one machine-gun company from the brigade machine-gun battalion. He apportions the attached infantry batteries (see pars. 852–861) and other auxiliary troops to regiments and retains a portion thereof under his own immediate control in accordance with the requirements of the situation.

839. During the approach march of his regiments and throughout the combat, he stations himself at points from which he can personally observe the course of the action and keep in touch with the situation on parts of his front screened from his view, by means of special patrols and observation posts.

The Attack.

840. The brigade commander keeps in touch at all times with the positions of his regiments and adjacent regiments and is prepared to cover any gaps which may arise between them by the use of his reserve battalions or machine-gun companies.

He advances his reserve from position to position in accordance with the progress of the attack and engages it when necessary to check a counterattack, to envelop a resistance, or take it in flank by operating through a gap arising between the regiments or between them and adjacent regiments.

By close touch with the division, he insures support of the attack by the divisional artillery.

He directs the displacement forward of infantry batteries remaining under his control whenever the advance of the assaulting battalions renders it practicable to do so.

When practicable, he employs his reserve machine guns to support the assaulting troops by overhead fire and to provide the necessary antiaircraft defense.

He keeps the division commander informed at all times as to the situation of his troops.

Organization of the Ground.

841. When the advance of the brigade is definitely stopped by hostile resistance, the brigade commander takes steps to organize his troops in depth, if the situation requires such action. Depending on the character of the hostile reaction anticipated, he disposes his brigade on one or two positions. In the latter case, either pursuant to instructions of higher commanders, or on his own initiative, he fixes on the line of resistance of the outpost zone and of the main position, assigns zones of depth to his regiments, arranges for artillery support, and organizes the machine-gun defense of the intermediate zone between the two positions. He organizes the defensive works to be constructed, determines on the order of their construction, details laboring parties, and allots the necessary engineer personnel and matériel to the different positions.

Under other circumstances, he may arrange for the defense of only one position with a single line of resistance.

Reserve Brigade.

842. When the division is deployed in column of brigades, the post of the commander of the reserve brigade is usually with the commander of the assaulting brigade, where he can maintain constant touch with the situation and be prepared to take over the rôle of commander of the assaulting troops when the moment for the engagement of his brigade arrives. He must be in communication at all times with his own brigade in order that he may promptly engage it or order up units from it as reinforcements to the first-line brigade when such action is ordered by the division commander.

Staff.

843. To assist them in the execution of his duties, the brigade commander has a tactical staff consisting of an adjutant and one assistant. An artillery officer is usually attached for purposes of liaison with the artillery and as a technical advisor in artillery matters. The brigade machine-gun officer acts as a technical and tactical assistant in machine-gun matters.

Sec. XV.—INTERCOMMUNICATION.

844. Communication is maintained by means of staff officers, runners, orderlies, carrier pigeons, telegraph, telephone, visual signals, radio, airplanes, and light signals (flares, rockets, etc.). The operation of the technical means of communication is governed by the provisions of "Liaison for All Arms of the Army."

845. The special personnel at the disposition of infantry units comprises signal units attached to brigades from divisional signal troops, the signal platoons of the infantry regiments, and the orderlies and runners attached to the headquarters of the several units.

846. Every infantry unit down to and including the battalion has an officer in charge of the communications and the message center of the unit. This officer is known as the liaison officer of the unit.

847. The message center consists of three sections: A courier secsection; a record section; a section for liaison agents. The courier section is under charge of an officer or petty officer of the signal platoon and controls the various mechanical means of transmission and all runners and couriers. It determines what means of transmission will be used and is responsible for the prompt delivery and acknowledgment and receipt of all orders and messages. The record section of the message center is under charge of a suitable officer or petty officer. This section is charged with the duplication, recording, coding, and decoding, and keeping the files of messages and orders sent and received. It determines the priority of messages to be sent where this has not been determined by the commanding officer. It prepares the necessary copies of messages and reports for the information of liaison agents and assists in the keeping of the war diary.

The section for liaison agents is directly in charge of the liaison officer. All information concerning the units of the liaison agents is sent to this section from the record section. Liaison agents will use their own couriers for messages. They may request the use of the mechanical means of the message center, and the liaison officer will assist them as far as possible, but no record is made of such messages.

848. In establishing the system of intercommunication, the division pushes forward an axial telephonic line, the head of which is at all times maintained at least as far forward as the regimental posts of command. This axial line should always be supplemented by radio stations, and whenever possible, by visual signaling stations. Brigades make connection with the axial line, employing the signal troops and matériel placed at their disposition by the division. Regiments similarly connect their posts of command or message centers with the axial line, employing the personnel and matériel of their signal platoons. The connection from the regiment forward to the battalions is, in so far as the nature of the operation renders it practicable to do so, also established by the regimental signal platoon under the direction of the rg. c.

849. Telephonic communication between the message center of infantry brigades and regiments and the message centers of supporting artillery units is maintained by the artillery. Communication with the artillery should as a general rule be effected through the artillery liaison officer.

850. The establishment of intercommunication by personal agents comprises:

A. Mounted messengers or cyclists.

B. Individual runners or runner relays.

Intercommunication by mounted messengers or cyclists is maintained as far forward as the hostile fire and the nature of the terrain will permit. The message center of each unit from which transmission by this means is practicable, should have a number of mounted messengers and cyclists at its disposal. The chain of communication by mounted messengers or cyclists should terminate at a message center.

Runners complete the transmission from the message center where service by mounted messenger ceases to the unit for whom the message is intended. They may operate either singly or in relays of runner posts. The latter method is necessary where heavily shelled areas must be crossed and the greatest possible rapidity of movement is required. When runner relays are employed, the posts should be established at points affording the best possible protection, and the distance between posts should not be excessive (150 to 300 yards). Runner relays are established by higher units, and the posts pushed forward behind the assaulting units as the advance progresses. When practicable, the routes followed by runners should be along telephone lines; in addition to their duties as transmission agents, runners are charged with discovering breaks in the line and with repairing them if possible; runners have a personal interest in the upkeep of these lines.

Where runner chains are not employed, each infantry unit before deployment sends one or more mounted orderlies, cyclists, or runners to the next higher unit; they serve as transmission agents from the higher unit to their own commanders. Each subordinate unit transmits its messages to the next higher unit and to adjacent units by its own personal agents.

Chains of Signalers.

851. In clear weather, rocket signals are the best means of rapidly transmitting the requests of the infantry to the artillery. For this purpose, chains of signalers should be organized prior to an attack. These chains should extend as far forward as the front line and should pass through the message centers of the various units; the intervals

between posts constituting the chain should be short enough to insure the transmission of signals through fog, dust, or smoke. In order to avoid errors, the general alignment of the chain should be perpendicular to the front, and only signals coming from the front received and transmitted.

Indication by assaulting battalions of their arrival on important terrain lines by means of pre-arranged rocket signals is one of the most effective methods of insuring effective artillery support and of keeping higher commanders informed as to the situation.

Sec. XVI.—SUPPORTING ARTILLERY.

852. Artillery units are temporarily assigned to infantry for the purpose of closer cooperation between the two arms and for fire on objectives which can not be observed from artillery positions located farther to the rear. The success of their action depends upon the immediate advantage taken by the infantry of the results obtained by their fire.

The artillery thus assigned may be divided into two classes: (a) infantry batteries; and (b) accompanying guns.

853. Infantry batteries are batteries employed as units under the direction of infantry brigade or regimental commanders. Accompanying guns are guns engaged as single pieces under the orders of infantry bn. cs.

These assignments are not permanent; they cease upon the execution of the mission for which they were made. Batteries are then returned to control of the divisional artillery commander.

854. If a battalion of artillery is assigned to a brigade, a suitable disposition will frequently be to use two batteries as infantry batteries and to break up one battery for use as accompanying guns. Infantry batteries should be fought as batteries, accompanying guns always by piece, each under an officer when practicable.

855. When there are two infantry batteries per infantry brigade, one may be assigned to each infantry regiment, or both held under the infantry bg. c. The former disposition is ordinarily preferable when regiments are deployed abreast.

When both infantry batteries are held under the infantry brigade commander, the artillery bn. c. commands these batteries, ordinarily remaining with the infantry bg. c. or in close communication with him. When the infantry batteries are assigned to infantry regiments the artillery bn. c. supervises the employment of his batteries, as well as the replacement of personnel, matériel, and ammunition.

The missions of infantry batteries include the attack of the stronger points of resistance, defense against local counterattacks, and firing on hostile reserves.

Fire is habitually by direct observation from near the battery position on specific objectives.

856. Accompanying guns are assigned to assaulting infantry battalions and placed under the command of the infantry bn. cs. The proportion may be one, or even two, per battalion, depending on the front covered.

Accompanying guns attack hostile machine guns, tanks, and strong points.

Fire is direct in the case of clearly visible or moving objectives; otherwise indirect. The range should be from 500 to 1,500 meters. Ranges are ordinarily estimated. A wide bracket (about 400 meters) is quickly obtained and searched. Ineffective ranges are eliminated during fire for effect.

The pieces are ordinarily moved, horsed, unlimbered under cover, and run forward by hand. Caissons are brought as near the pieces as conditions permit. Accompanying guns find their protection principally in the small target presented, in concealment by natural features, and in their mobility. Two or more caissons should be assigned for the ammunition supply of each piece.

Nearby infantry reserves should be called upon to assist in ammunition supply and in the movement of the piece when necessary.

857. The functions of infantry commanders, having either infantry batteries or accompanying guns under their command, generally consist in indicating missions and supplying information as to enemy and friendly dispositions. Technical details and methods should be left as far as possible to the artillery commander. However, in the absence of a specific mission, the artillery commander should, on his own initiative, use the means at his disposal to locate and attack suitable objectives.

In general, the artillery commander is responsible that the full power of his weapons is developed and aggressively used. The infantry commander must apply this power where it will best assist the infantry.

858. Infantry commanders assigning a mission to the battery should state definitely the locality to be fired upon and the positions of friendly troops. The selection of positions should be left within rather wide limits to the battery commander. The time of attack should be arranged after consulting the battery commander as to the time necessary for the latter to go into battery.

859. Up to the time of the assignment of a mission the battery commander remains with, or in close touch with, the infantry commander to whom he is attached. When assigned a mission, the battery commander hastens to join the infantry commander whose unit he is to support. After obtaining the necessary information as to the operation contemplated, he makes a rapid reconnaissance of position and meets the battery on arrival in the vicinity or sends an agent to conduct it to the position. The position selected should be at as short a range as is possible, consistent with proper concealment and ammunition supply.

860. Visual concealment in position must be had, but protection must be limited ordinarily to that afforded by the natural features of the position selected. The construction of emplacements is carried only as far as is absolutely necessary for firing. Previously prepared sand bags are necessary. Protection for the cannoneers must not be allowed to delay the opening of fire. The deep defilade possible with this piece is ample protection against hostile fire under open-warfare conditions. The moral and material effect of a rapid fire, promptly delivered, is great, but if the fire is delayed, the enemy is allowed to protect his dispositions, all the while inflicting losses on our infantry.

861. When a mission has been accomplished the matériel should be at once withdrawn and loaded on the transport for a further advance.

Artillery Supports.

862. The purpose of the artillery support is to guard the artillery against surprise or attack (see Art. 761).

Artillery on the march or in action is ordinarily so placed as to be amply protected by the infantry. Infantry always protects artillery in its neighborhood.

863. The detail of a support is not necessary except when the artillery is separated from the main body or occupies a position in which its flanks are not protected.

The detail of a special support will be avoided whenever possible.

864. The formation of an artillery support depends upon circumstances. On the march it may often be necessary to provide advance, flank, and rear protection. The country must be thoroughly reconnoitered by patrols within long rifle range.

865. In action, the formation and location of the support must be such as to gain and give timely information of the enemy's approach and to offer actual resistance to the enemy beyond effective rifle range of the artillery's flanks. It should not be close enough to the artillery to suffer from fire directed at the artillery. In most cases a position somewhat to the flank and rear best fulfills these conditions.

866. The support commander is charged only with the protection of the artillery. The tactical employment of each arm rests with its commander. The two should cooperate.

Sec. XVII.—INFANTRY AND AIRPLANES.

867. During all offensive operations, the men carrying panels or flares should keep them in a handy accessible position. All men should be thoroughly instructed regarding the airplane signals, markings, and general characteristics of enemy and friendly airplanes. One man from each platoon will be designated especially to watch airplanes. Immediately upon being sighted, an airplane should be closely watched until it is ascertained whether it is enemy or friendly. If it is hostile, preparations will at once be made for firing against it by means of small arms and machine-gun fire, but no firing will be permitted until directed by platoon or higher commanders. If it is friendly, it will be closely watched for signals. If in wooded country or in deep ravines, the panels will not be shown, but Bengal flares will be burnt at such intervals as to mark the salient points of the line. When the airplane gives the signal, "Understood," all panels will be put away immediately, and the flares will be extinguished, if still burning. All regimental and battalion command posts will display their panels upon receiving the signal, "Where are you?" from the airplane. Response must be made only to the airplane which identifies itself by signal as the airplane assigned to the division.

868. During combat, every machine gun that is not engaged against terrestrial targets will fire on low-flying hostile airplanes. On the march, machine guns must be prepared to go into action against airplanes on very short notice. To obtain a successful result from rifle fire against airplanes, the combined fire of at least a platoon will ordinarily be necessary; good fire control and discipline and especial instruction in fire against aerial targets are essential to success. Against very low-flying airplanes, single shots may be successful under favorable conditions.

Sec. XVIII.—MEETING ENGAGEMENTS.

869. Meeting engagements are characterized by the necessity for hasty reconnaissance, or the almost total absence of reconnaissance;

by the necessity for rapid deployment, frequently under fire; and usually by the absence of trenches or other artificial cover. These conditions give further advantage to the offensive.

870. The whole situation will usually indicate beforehand the proper general action to be taken on meeting the enemy.

871. Little fresh information can be expected. The boldness, initiative, and determination of the commander must be relied upon.

872. A meeting engagement affords an ideal opportunity to the commander who has intuition and quick decision and who is willing to take chances. His opponent is likely to be overcautious.

873. The amount of information that the commander is warranted in awaiting before taking final action depends entirely upon his mission. One situation may demand a blind attack; another may demand rapid, partial deployment for attack, but careful and time-consuming reconnaissance before the attack is launched.

874. A great advantage accrues to the side which can deploy the faster. The advantage of a close-order formation, favoring rapid deployment, becomes more pronounced with the size of the force.

875. The first troops to deploy will be able to attack with longer firing lines and weaker supports than are required in the ordinary case. But if the enemy succeeds in deploying a strong defensive line, the attack must be strengthened accordingly before it is wasted.

876. If the situation warrants the advance, the leading troops seek to deploy faster than the enemy, to reach his flanks, check his deployment, and get information. In any event, they seek to cover the deployment of their own troops in rear—especially the artillery—and to seize important ground.

877. The commander of a long column which meets the enemy should be with the advance guard to receive information promptly and to reconnoiter. If he decides to fight, the advance guard must hold the enemy while the commander formulates a plan of action, issues the necessary orders, and deploys the main body. Meantime, the column should be closing up, either in mass or to form line of columns, so that the deployment, when determined upon, may be made more promptly.

878. The action of the advance guard, prior to the receipt of orders, depends upon the situation. Whether to attack determinedly or only as a feint, or to assume the defensive, depends upon the strength of the advance guard, the terrain, the character of the hostile force encountered, and the mission and intentions of the commander of the whole.

879. If the enemy is beforehand or more aggressive, or if the advance guard is too weak, it may be necessary to put elements of the main body into action as fast as they arrive, in order to check him. This method should be avoided; it prevents the formation and execution of a definite plan and compels piecemeal action. The best results are obtained when the main body is used as a whole.

The Surprise.

880. To be surprised is never justifiable in warfare. If, however, due to insufficient reconnaissance, troops are forced into action directly from a formation unsuitable for combat or come unexpectedly under effective fire of the enemy before development and deployment, boldness in decision and in action is usually the best line of conduct. If the enemy is still beyond close range, quick development of fire is important. Here the artillery must be put into action at once, to deliver a heavy fire upon the most threatening bodies of the enemy. If the enemy is so near that a charge is practicable, recourse to the bayonet must be unhesitating. This principle applies particularly well where troops suddenly encounter the enemy in the local phases of a battle. To attempt to retire at once when surprised is to risk annihilation.

Infantry Against Cavalry.

881. A cavalry charge can accomplish little against infantry, even in inferior numbers, unless the latter are surprised, become panic-stricken, run away, or can not use their rifles.

882. A charge from the front is easily checked by a well-directed and sustained fire.

If the charge is directed against the flank of the firing line, the supports, reserves, or machine guns should stop it. If this disposition is impracticable, part of the line must meet the charge by a timely change of front. If the flank company, or companies, in the firing line execute **platoons right**, the successive firing lines can ordinarily break a charge against the flank. If the cavalry line passes through the firing line, the latter will be little damaged if the men retain their presence of mind. They should be on the watch for succeeding cavalry lines and leave those that have passed through to friendly troops in rear.

883. Men standing are in the best position to meet a charge, but other considerations may compel them to meet it lying prone.

884. In a mêlée, the infantryman with his bayonet has at least an even chance with the cavalryman, but the main dependence of infantry is rifle fire. Any formation is suitable that permits the free use of the necessary number of rifles.

Ordinarily there will be no time to change or set sights. Fire at will with battle sight should be used, whatever the range may be. It will usually be unwise to open fire at long ranges.

885. An infantry column that encounters cavalry should deploy at once. If attacked from the head or rear of the column, and if time is pressing, it may form a succession of skirmish lines. Infantry, by deploying 50 or 100 yards in rear of an obstacle, may check cavalry and hold it under fire beyond effective pistol range.

In any situation, to try to escape the issue by running is the worst and most dangerous course the infantry can adopt.

886. In attacking dismounted calvary, infantry should close rapidly and endeavor to prevent remounting. Infantry which adopts this course will not be seriously checked by delaying cavalry.

Every effort should be made to locate and open fire on the led horses.

Infantry Against Artillery.

887. A frontal attack against artillery has little chance of succeeding unless it can be started from cover at comparatively short range. Beyond short range, the frontal fire of infantry has little effect against the artillery personnel because of their protective shields.

Machine guns, because their cone of fire is more compact, will have greater effect, but on the other hand they will have fewer opportunities and they are limited to fire attack only.

As a rule, one's own artillery is the best weapon against hostile artillery.

888. Artillery attacked in flank by infantry can be severely damaged. Oblique or flank fire will begin to have decisive effect when delivered at effective range from a point to one side of the artillery's line of fire and distant from it by about half the range. Artillery is better protected on the side of the caisson (Art. 761).

889. Guns out of ammunition, but otherwise secure against infantry attack, may be immobilized by fire which will prevent their withdrawal, or by locating and driving off their limbers. Or they may be kept out of action by fire which will prevent the receipt of ammunition.

890. Artillery when limbered is helpless against infantry fire. If caught at effective range while coming into action or while limbering, artillery can be severely punished by infantry fire.

In attacking artillery that is trying to escape, the wheel horses are the best targets.

Summary of Combat Principles.

891. 1. Avoid combats that offer no chance of victory or other valuable results.

2. Make every effort for the success of the general plan and avoid spectacular plays that have no bearing on the general result.

3. Have a definite plan and carry it out vigorously. Do not vacillate.

4. Do not attempt complicated maneuvers.

5. Keep the command in hand; avoid undue extension and dispersion.

6. Study the ground and direct the advance in such a way as to take advantage of all available cover and thereby diminish losses.

7. Never deploy until the purpose and the proper direction are known.

8. Deploy enough men for the immediate task in hand; hold out the rest and avoid undue haste in committing them to the action.

9. Flanks must be protected either by reserves, fortifications, or the terrain.

10. In a decisive action, gain and keep fire superiority.

11. Keep up reconnaissance.

12. Use the reserve, but not until needed or a very favorable opportunity for its use presents itself. Keep some reserve as long as practicable.

13. Do not hesitate to sacrifice the command if the result is worth the cost.

14. Spare the command all unnecessary hardships and exertion.

CHAPTER V.

DEFENSIVE COMBAT.

Sec. I.—GENERAL PRINCIPLES.

892. The defensive is a form of action to be deliberately chosen only for the purpose of economizing troops on a front where a decision is not sought in order to concentrate superior forces at the point of decisive action. The defensive may, however, be imposed by the situation.

The **economy of force** effected by a *limited* defensive is the means of preserving the initiative of the commander.

On a defensive front, economy of force (holding out of reserves) is the means of enabling the defender to meet the attacker's initiative and of transforming a defensive attitude into an offensive.

Whatever may be the character of the defense (voluntary or imposed), the tactics of defensive action are essentially the tactics of holding extensive fronts with relatively weak forces.

893. All successful defense is based upon the **vigilance** and **fighting power** of the troops. The principles of defense serve only to give these qualities the best opportunity for their development; they have no inherent value of their own. The defensive forces must quickly discover a hostile attack, promptly form for action, and open fire without delay on the most important objectives.

894. The defense, no less than the offense, must, wherever possible, act by **surprise**. The visible lines of a defensive system must not betray the defensive dispositions, but rather act as a mask that conceals the real defensive organization.

895. The defense must be **mobile**. Mobility is acquired either by the holding out of large reserves as units of maneuver, or by distribution of the defenses in depth.

The holding out of large reserves as units of maneuver endows the defensive force with mobility by enabling it to meet the attack wherever it develops and to counterattack in force at points of decisive importance.

The distribution of defenses in depth contributes to defensive mobility by permitting of the offering of resistance to the flanks as well as to the front. Depth of defenses must, however, be adjusted to the situation (see paragraph 901).

896. The defense must be **aggressive.** The counterattack is the decisive element of defensive action. It is impossible to hold any defensive system by a merely passive resistance. The defense as well as the offense must act by movement as well as by fire.

Unless all unit commanders seize every opportunity for counterattack, the attacking force must eventually succeed in driving the defenders out of their positions.

897. The defense must be **flexible.** The dispositions dictated by a stabilized situation are not adapted to the first contact of opposing forces nor to the moving warfare consequent on the break-up of stabilization. In stabilized warfare, the large force of artillery which the attacker can mass to support his attack requires thinly held front lines and such distribution in depth that concentrated targets will not be offered to hostile artillery. In the war of movement, neither this mass of artillery nor the unlimited supply of ammunition will be available, and inability of our own artillery to recognize and shell the hostile lines will increase the importance of the action of the infantry in resisting the attack. The front lines may and should be therefore more densely held.

Under different situations and at different stages of the occupation of the same position, defensive dispositions will present wide degrees of variance.

The defensive organization will tend toward the line or an area depending on the relative importance to be attached to frontal field of fire and hostile artillery fire effect. It is the task of the commander to adapt his dispositions to the situation with which he is confronted.

898. The **tactical principles of open warfare** must be the basis of the organization of units for defense. Whatever elaboration the stationary character of operations may at any time permit, must not disrupt this organization or produce tactical groupings which will

be dissolved the moment the enemy effects a rupture in the defensive dispositions.

Any defensive disposition that presumes the indefinite continuance of stabilized conditions is necessarily defective.

Orders.

899. The general principles of these regulations relative to the character of orders for the attack apply in large measure to the defense (see paragraphs 595 et seq). Due, however, to the more complete organization of which defensive action is capable, orders may go into greater detail as to the defensive conduct of units than in the case of the attack. But the temptation to concentrate all initiative in the hands of higher commanders and to build up an elaborate system based on the technique of the various weapons and the several arms must be strenuously resisted. Such a system will dissolve the moment any rupture in the defensive system occurs and will render a rapid change to the offensive impossible. Tactical unity must be the basis of defense as well as of offense.

Sec. II.—SELECTION OF THE POSITION.

900. Regard being had to the special requirements of any situation, the material factors that exercise the greatest influence on the selection of a defensive position are the communications to the rear and the facilities for observation. The features of the terrain that control these factors determine the *general lie* of the defensive position.

Local circumstances determine the more exact location of the position (field of fire, cover, etc., see paragraphs 903 to 907).

901. The depth of the defensive zone is dependent on the tactical situation, which under all circumstances is controlling. Where a violent bombardment by massed hostile artillery must be reckoned with, the depth of the position must be sufficiently great to force the enemy to scatter his fire over a wide area and so minimize its effects that he will be unable to neutralize the entire defensive system by his preparatory fire. In addition, a second position at such distance from the front line (6,000–8,000 yards) that it can not be taken under fire by the artillery firing on the first position will generally be organized. This will be the most usual disposition in position warfare.

When less weight is to be attributed to the factor of artillery bombardment, the defense will concentrate its means in a shallower zone in order to avoid undue dispersion of its forces and exposure to defeat in detail. The main defense will be made on a *line* of resistance. In rear of the line of resistance and within supporting distance from it, a reserve line, designed to limit the effect of a hostile penetration of the line of resistance, may sometimes be organized. This will be the most usual disposition in open warfare, where the attacker will not have at his disposal the mass of artillery, the unlimited supply of ammunition, or the exact knowledge of the defensive dispositions and of the location of his own attacking infantry that will usually be available in position warfare.

902. The value of frontal field of fire varies between wide limits, depending on the situation. A long frontal field of fire usually carries with it exposure to hostile view and hostile artillery fire. In the early stages of an engagement in open warfare, however, before the attacker has been able to acquire exact information as to the defensive dispositions and to mass the fire of his artillery against them, the importance of opening fire on the advancing troops at long range and subjecting them to demoralizing losses during their advance, will outweigh these disadvantages. Since at this stage of defense, all infantry fire is necessarily frontal, the initial deployment for defense should, as a rule, be made with a view to the development of maximum frontal fire effect.

The close approach of the attacking forces deprives the advanced defensive position of an extensive frontal field of fire, and consequently increases the importance of flanking action. Rearward defensive lines may retain the full value of frontal field of fire. During a prolonged contact of the opposing forces, the more exact knowledge acquired by the attacker of all defensive dispositions exposed to direct observation and the mass of artillery which he can assemble to support his attack, may, however, neutralize the advantage of an extensive frontal field of fire for all defensive lines within range. It may, therefore, be necessary to sacrifice frontal field of fire in order to escape direct hostile observation; the loss is compensated for by the organization of a dense flanking fire with automatic weapons.

The importance of flanking fire increases with the decrease in frontal field of fire, i. e., in direct ratio with the proximity of the enemy.

It also increases with an increase in the intervals between supporting points. (See pars. 904 and 922.)

The above considerations determine the order of construction of the elements of a defensive position. (See par. 918.)

903. Figure 17 shows the advantages and disadvantages of the various sites for lines of defense; the site to be selected will vary according to the relative weight to be assigned the various factors of the situation, which are in the main: Field of fire, artillery support, hostile artillery fire effect, concealment of defensive dispositions, protection of communications to the rear, and observation of the foreground of the position.

(*a*) At *A* (foot of forward slope) there is an extensive field of fire and grazing fire effect. The hostile ground is well observed, and artillery support is good. However, hostile artillery sees the trench *A* and the ground *A*—*B*—*C*. The enemy can direct accurate fire on the position and effectively support his infantry. Communications and the movement of troops in rear of the position are difficult.

(*b*) At *B* (military crest) there is a good field of fire and distant observation, but artillery support is very difficult on the slopes in front of *B*. Field artillery can effectively reach the slopes close in front of the advance line only by batteries placed in flanking positions. Moreover, hostile artillery readily sees the trench *B* and the ground *B*—*C*. The slope *A*—*B* permits the enemy to support his infantry to within a very short distance of the trench *B*.

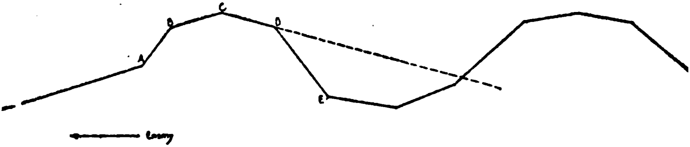


FIG. 17.

(*c*) At *C* (topographical crest) there is distant observation, but field of fire *C*—*B* is usually short. All terrain in rear of *C* is concealed from hostile observation. Communications are protected. Artillery support on the terrain *C*—*B* is very difficult, as this terrain is seen only from *C*.

(*d*) At *D* (reverse slope) distant observation of the enemy is entirely lost. The field of fire *D*—*C* is short, but there are no difficulties of close artillery support. The enemy has distant observation from *C*, but beginning at *D*, the terrain has a large dead angle screened from enemy observation. Hostile artillery will have difficulty in firing on the slope *D*—*C*.

(*e*) At *E* (foot of reverse slope) there is the benefit of good support by artillery, and on the other hand, hostile artillery support will be difficult. All ground in rear of *E* is subjected to hostile observation and fire.

No absolute rule as to which position should be occupied can be prescribed. It will sometimes be advisable to establish the line of resistance on the reverse slope with a line of observation on the forward slope or to place the line of resistance on the forward slope (foot of forward slope or military crest) and a reserve line on the reverse slope.

A reverse-slope position can as a rule be effectively defended only when points affording the observation required for the effective action of the supporting arms of the defense are retained and those giving views into the defensive dispositions are denied to the enemy. Such a disposition permits of the full development of the fire of the supporting arms of the defense and reduces the effectiveness of the fire of the supporting arms of the attack. When a reverse-slope position is held, the loss of frontal field of fire must be compensated by the organization of a dense flanking fire by automatic arms. The supporting arms must be able to prevent the enemy from occupying the crest in front, or the infantry must be capable of at once ejecting by counter attack any hostile element which succeeds in effecting a lodgment on it.

The conditions required for the effective defense of a reverse-slope position will often be difficult to realize.

Sec. III.—DEPLOYMENT FOR DEFENSE.

904. A position should not as a rule be defended by an occupation in uniform density along the entire front, but rather by holding in strength the tactical localities which constitute the key points of the position and by providing for the main defense of the intervals between such points by flanking fire and counter attack. The key points of a defensive system are, in the main, points that control the communications of the defense and are therefore indispensable to the sustained progress of the attack (road centers, villages, etc.), and the features of the terrain which afford extensive views either into the defensive position or over the foreground. Features of the terrain that afford cover or concealment or good fields of fire and flankings constitute minor tactical localities.

By strongly holding these tactical localities as supporting points, the defense aims to limit the hostile penetration of its position and overwhelm the penetrating elements by counter attack at a time when they are at a relative disadvantage in respect to supporting fire and to communications and supply. The superiority of the defense in this respect should be pronounced, since the penetrating force will have lost in large measure the support of its artillery and will dispose only of such communications as it is able to improvise in the stress of battle while the supporting fire and the communications of the defense are unimpaired.

If the defender succeeds in holding the flanks of the gap so strongly as to resist all attempts to widen it, it will be difficult for the attacker to maintain himself in the deep salient with a narrow base which the penetration has created.

905. The line of resistance is the line which must be held by the troops assigned to the defense of the position. It is not essential that the actual resistance be offered on the line of resistance; the defense may sometimes be most effectively made over a zone of resistance in which the actual line of resistance is included, and combat delivered in and about the assigned line for its possession. The conclusion of the engagement must in any case find the assigned line of resistance in the possession of the defending force. When a position is to be held by the defense of a zone, the lines to be held by each of the echeloned elements must be clearly defined in orders of the proper commanders.

Resistance is therefore offered on a series of tactical localities organized as supporting points, and separated by such lateral intervals and echeloned in such depth as circumstances of the particular situation may require.

The assignment of a line of resistance defines the mission of the defending force.

906. The troops of the defense are disposed in a depth varying with the tactical situation. The objects to be accomplished by the distribution in depth are:

(*a*) To provide security and gain time for manning the defenses of the main line of resistance;

(*b*) To avoid concentrations which would expose the defensive forces to excessive losses and neutralization by hostile fire;

(*c*) To limit the effect of surprise attacks and to permit the offering of lines of resistance to a flank as well as to the front.

907. When the main defensive position is preceded by an outpost zone, the larger infantry units, regiments, and brigades are generally deployed in sectors extending over both zones, battalions and smaller units over one zone only. The deployment in depth is, however, dependent on the frontage assigned to the unit; units assigned a narrow frontage deploy in relatively great depth.

When the defensive organization comprises one zone of resistance only, each battalion in the first line furnishes the outguards for its own front.

Unity of command and tactical control exercise an important influence on the nature of the deployment. A unit assigned to an area in which the depth as compared with the frontage is very great is more effectively controlled by disposing the component units in depth (in column), while in the inverse case control is more effectively insured by disposing them abreast.

908. Whether disposed over one or two zones, combat under any particular situation is delivered for the defense of one main line of resistance only. Where two zones are held, no doubt must exist as to the zone in which the principal resistance is to be offered. When the principal resistance is not to be offered in the advanced zone, the function of the first line units is that of an outpost, i. e., the the security of the command, the repulse of minor attacks and raids, and the prevention of the occupation of the foreground of the position by the enemy. The strength of the outpost should not exceed that required for the security of the combat troops. The outpost holds its position in case of attack unless a withdrawal is ordered by higher commanders.

Under circumstances where an overwhelming bombardment of the position may be expected, the line of resistance is held by the defense of a zone in which the resisting elements are disposed in echelon (checkerboard formation), each flanking the front or covering the flanks of the others (see par. 959). Whether the position is held by defense on a line or over a zone, the aim in either case must be the same: To unify all means of defense and to avoid dispersion of effort.

Distribution in depth does not imply dispersion of force. The successive elements of the defense must be within supporting distance of each other. Supporting distance is such as will permit of effective support by fire and counterattack.

909. Units assigned to the defense of any position are generally deployed in two echelons: A holding garrison designed for the immediate defense of a portion of the position and a support or reserve which has the mission of counterattack or of reenforcing the holding garrison.

915. Artillery units or single pieces are attached to infantry units and placed under the orders of the infantry commanders. Their missions are close support of infantry in defense, antitank defense, and accompaniment of counterattacks. The principles of the employment of such artillery are in general the same as those of infantry batteries and accompanying artillery in the offense. During periods of stabilization a certain proportion are held as silent guns which open fire only in case of attack against hostile infantry, machine guns, and tanks, while others are employed for daily firing on targets which are particularly troublesome to the infantry. The divisional artillery retains responsibility for the supply of ammunition and stores to artillery units attached to the infantry. Attached artillery remains under the orders of its higher commanders for administration and discipline.

In the attachment and detachment of artillery units, orders must leave no doubt as to the commander under whose control they are to serve and as to the time when they come under and pass from his control.

916. In deployment for defense, as well as for offense, the integrity of tactical units must be maintained. It is prohibited to segregate men of rifle companies into groups of specialists (autoriflemen, riflemen, handbombers, rifle grenadiers, etc.). Such groupings can only be effective so long as a stabilized defense can be maintained and will dissolve as soon as a rupture in defensive dispositions occurs or it becomes necessary to take the offensive. Infantry on the defense will fight as on the offense in combat groups of uniform composition (squads, sections, and platoons).

SEC. IV.—TACTICAL ORGANIZATION OF THE GROUND.

917. In principle, infantry on the defensive intrenches. The extent of the defensive works depends upon the time available for their construction.

In the hasty occupation of a position, it is first of all important to locate the troops so as best to take advantage of the features of natural strength. Fortifications are constructed with a view to increasing the natural strength of the position as permitted by the time available.

918. The defense is made on a series of supporting points (linear or echeloned). In the initial deployment for defense, supporting points will be disposed in an approximately linear distributuon. In a protracted defense, they will be echeloned in depth as well as in width. The organization of the supporting points themselves will also vary widely at different stages of the defense. At first, they will consist of simple lengths of trench sited for frontal and flanking fire and paralleled by cover or fire trenches for local supports and reserves. As soon as practicable, these are connected with each other by communicating trenches and developed into closed works capable of all-around defense.

The first immediate necessity in the construction of a line of supporting points is the front line with a continuous obstacle and cover for supports and reserves.

In a prolonged occupation of the defensive position, splinter and bombproof shelters are constructed, and numerous alternative combat emplacements are developed. Dummy trenches are constructed to divert the fire of hostile artillery.

919. In combat exercises when it is impracticable to construct the trenches appropriate to the exercise, their trace may be outlined by bayonets, stakes, or other markers, and the responsible officers required to indicate the profile selected, method and time of construction, garrisons, etc.

920. The distance between the several lines of trenches or combat emplacements parallel to the front should, when practicable, be such that:

(*a*) The garrisons of the rearward lines are able to cover by fire the flanks of the combat emplacements of the line immediately in front of them.

(*b*) The garrison of each rearward line does not fall within the zone of dispersion of hostile fire directed on the line immediately in its front, and friendly artillery can fire on hostile troops which have occupied one line without endangering our own troops in another. The safe zone of light artillery is 100 yards. That of heavy artillery is 300 yards.

(*c*) Rapid counterattacks against the flanks of hostile elements penetrating the position are facilitated.

921. All lines should, when practicable, be sited and constructed with a view to recapture by counterattack or to rendering them untenable to the enemy by fire from rearward lines.

922. The general direction of parallels and approaches is determined by the general direction of the front to be defended; their site by the considerations set forth in paragraphs 561–565; their trace by the field of fire, frontal, oblique or flanking, to be covered.

In general, the trace follows the contour of the ground. Salients and reentrants are created only to the extent required for the efficient action of such flanking weapons as are to be emplaced in the trenches. As far as practicable, the natural salients formed by the ground forms are utilized as the flanking salients of field works.

The main flanking defense is furnished by weapons emplaced outside of the trenches. Machine guns are, as a rule, sited in positions detached from the trenches.

The most efficient flanking defense is rendered by weapons characterized by penetrating force and rapidity of fire (automatic arms).

Flanking defenses, in combination with obstacles that arrest the enemy under the fire of flanking weapons, are the principal means of effecting the **economy of force**; which is the essence of all defensive action.

The direction of fire of flanking defenses permits of their concealment from the direct frontal observation of the enemy. They therefore have the advantage of being able to act with the effect of surprise, in addition to the protection afforded by concealment. Since the conditions which make concealment from direct frontal observation a factor of the first importance are the same as those requiring great distribution in depth, the intensive development of flanking defenses is a distinguishing characteristic of the defense in depth.

Flanking defenses permit the defender to sacrifice *extensive* frontal field of fire. A line established on a reverse slope near the crest may become extremely strong due to good flanking defenses of the ground immediately in front of it.

The weakness of flanking defenses lies in their exposure to frontal attack. Their effectiveness, therefore, depends upon the efficiency of the frontal defensive elements. A position can not be held by flanking defenses alone. If frontal resistance is destroyed, the flanking defenses must fall. Frontal and flanking defenses must mutually supplement one another.

923. The purpose of the *flank elements of field works* is to enable the garrison to offer lines of resistance to a flank as well as to the front. While in an initial deployment for defense, the construction of the frontal elements is of the first importance, provision must be ultimately made in the stubborn defense of a position for meeting an attack from a flank. The danger of disposing the defensive forces with a view to resistance of an attack from a preconceived direction must be avoided. Hostile penetration of an adjacent sector may radically transform the direction of the attack. Regard must also be especially had to this contingency in disposing the flanking defenses; flanking weapons are therefore as a general rule best disposed when they have a field of fire in as many directions as possible.

924. The purpose of parallels and approaches is to assure communications laterally and to the rear and to furnish combat emplacements on more or less extended lengths. The defense of intervals between combat emplacements is assured by the flanking fire of the combat groups holding these emplacements and of combat groups and machine guns situated to the rear. The combat emplacements should be selected with this end in view.

925. Approach trenches connect the various parallels with each other and the rear. In siting approach trenches, the advantage to be gained by incorporating them into the defensive system as lateral lines of defense should be considered (Fig. 18).

926. Obstacles should be organized as soon as possible in order to hold the enemy under the fire of the defenders as long as possible. Obstacles are of no value unless they are thoroughly swept by fire. A combination of obstacles and fire is equivalent to an increase of fire power.

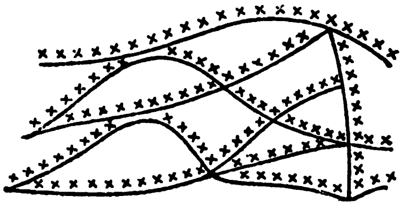


FIG. 18.

927. In general, obstacles are employed for two purposes:

(*a*) To prevent a sudden irruption of hostile forces into the front line of defense;

(*b*) To hold the attacking forces as long as possible under the flanking fire of automatic weapons.

The general lie of obstacles therefore depends upon the flankings. The plan of obstacles and the flankings should be considered at the same time.

928. By a proper coordination of the flankings and the obstacles and a suitable arrangement of gaps, attempt should be made to canalize the attacking troops into certain avenues of approach where they will come under the destructive fire of machine guns (Fig. 19).

929. Command posts should be selected with a view to observation. They should, if practicable, be so situated that commanders have an uninterrupted view forward, backward, and to the flanks, to the next higher command post, and over the foreground, and can keep up communication by messengers. In addition, special observation stations should be established on the commanding points of the terrain in such manner that the entire foreground and all ground within the position itself is under constant observation.

Sec. V.—CONDUCT OF THE DEFENSE.

930. The conduct of an outpost as an agency in the service of security of the defense is described in Par. 303 et seq.

931. While the hostile attack is developing, patrols in front of the line of observation delay and harrass the enemy while retiring on the defensive position. Especially strong patrols with machine guns operating well to the front may be assigned this mission. By their fire and their movement in retirement, if practicable in conjunction with dummy works, they endeavor to deceive the enemy as to the defensive dispositions, lead him in a false direction, and cause him to deploy prematurely and on incorrect lines. They occupy successive positions on commanding ground and take advantage of every opportunity to open a heavy surprise fire on formed bodies of hostile troops, without, however, permitting their retreat to be cut off.

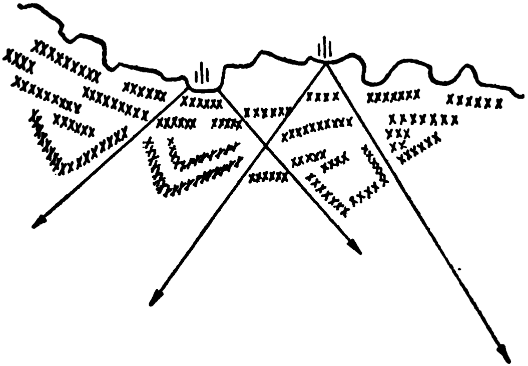


FIG. 19.

932. While the engagement between the covering detachments of the two opposing forces is developing, long-range artillery opens fire on hostile communications, road centers, and other sensitive points in the zone of the attack. As the attacking troops approach more closely to the defensive position, field artillery, machine guns, one-pounders, and light mortars open fire on the advancing infantry and on located or suspected assembly points of reserves.

933. Infantry opens fire on favorable objectives at mid range. Such fire can not, however, have any further effect, in addition to the losses which it inflicts, than to delay the defender's advance. The attack will always succeed in reaching assaulting distance from the defensive position, either under the cover of darkness or of fog or under the protection of its own fire. The delay effected will, however, gain time for the defense to perfect its dispositions and reinforce the threatened point.

934. When the front and direction of the hostile attack has been determined, the defense at once takes steps to meet it. Fire on the advancing infantry is continued, the outguards are withdrawn, and the defense on the threatened front is reinforced. The reinforcement does not as a rule provide for an increase in the number of men assigned to the holding garrisons; it is generally applied to the reserve. The result of the reinforcement is to increase the force designed for aggressive action rather than that intended for merely passive defense. Against minor attacks, the reinforcement may be effected by transferring the reserve of adjacent units to the threatened sector.

935. When the assault forms up at close range to the front line, the outguards set up the appropriate signal (rocket) for annihilating fire from the line of observation in case they discover a hostile concentration for attacking in their front. In case the plan of defense contemplates an artillery barrage, they similarly set up the signal for artillery barrage either from the line of observation or when close enough to the line of resistance to insure their not being cut off by the friendly barrage. Outguards repel hostile patrol enterprises on the line of observation. Where the defense is made on two zones of resistance, the outpost repels minor attacks and raids on its line of resistance.

936. In order that the hostile attack may be prevented from reaching the line of resistance, the defense must gain and maintain fire superiority over the attack. In defense, fire superiority is obtained, not by the volume of fire, but by a well aimed and well directed fire, which inflicts losses on the enemy and causes his fire to become inaccurate.

937. As a general rule, the defense can not gain fire superiority by virtue of superiority in the means which it puts into action.

The ability to attack as a general rule presupposes superiority of means on the part of the offense. The defense must rely for fire superiority on the more methodical organization of its fire, especially its flankings, more accurate knowledge of ranges and of the terrain, the protection afforded by intrenchments against hostile fire, the concealment of its dispositions, and the disorganization which movement and the accessory defenses produce in the attacker's disposition.

938. During the advance of the attacking troops, the artillery and machine guns, using direct or indirect fire, subject the hostile infantry to a destructive fire. The infantry batteries, trench mortars, 1-pounders, and machine guns open fire on hostile infantry and its accompanying weapons, machine guns, automatic rifles, and tanks.

939. At night or in a fog, the flanking fire of the machine guns constitutes a vital element in the defense of a position. As these weapons can be laid on their lines of fire by day, they retain their full accuracy in night firing. A single machine gun can by flanking fire repel the most determined assault against the front which it covers. At night or in a fog the holding garrisons of supporting points should be considerably reinforced.

940. Rifle grenades or hand grenades are used against hostile troops which have taken cover and can not be reached by direct fire; and in repulse of night attacks.

941. A unit intrusted with the defense of an area or a position must under no circumstances abandon it unless it has been authorized to do so in certain contingencies by higher commanders.

942. During the assault, adjacent units support each other with flanking fire. Should the assault succeed in reaching the defensive position, riflemen leaping on the parapet meet the enemy with the bayonet.

943. Should the enemy succeed in penetrating the position, the defender should aim to strengthen the flanks of the gap and maintain his hold on the tactical localities (supporting points) on either side of the gap, resist all attempts to widen it, and counterattack on the flanks of the salient rather than to attempt to close the gap by throwing troops across the head of the salient. For this reason, the organized areas held by units of varying importance which constitute the tactical localities of the defense, should have lines of resistance to the flanks similar to those to the front. From these lines of resistance the garrisons of the organized areas take the penetrating elements under a destructive flanking fire, arrest their progress, and prepare and support the counterattack,

944. Every infantry unit should take immediate advantage of any gap occuring behind a hostile force which has succeeded in penetrating the defensive position, to filter groups or units through the gap with a view to building up a strong point in the enemy's rear. The demoralizing effect of fire from the rear will often produce important results.

945. If the enemy is defeated, he will be in no position to withstand a determined counteroffensive. The defensive must be prepared at all times to change to the offensive and exploit the results of successful defensive action.

Sec. VI.—COUNTERATTACK.

946. The counterattack should be made vigorously and at the proper time. It will usually be made:

By launching the reserve against the enemy's flank when the attack is in full progress; this is the most effective form of counterattack.

Straight to the front by units in the first line with their supports after repulsing the enemy's attack and demoralizing him with pursuing fire.

Or by the troops in rear of the first line when the enemy has reached or penetrated the position.

947. Every unit at once expels by counterattack any hostile force penetrating its area, zone, or sector, unless a withdrawal has been authorized by higher commanders.

948. Counterattacks include:

Immediate counterattacks by infantry only (front-line troops, local supports and reserves).

Counterattacks with artillery preparation or accompanied by tanks or infantry guns (sector and general reserves).

949. Counterattacks against an enemy who has penetrated the position should be launched as soon as possible before the enemy has had time to organize the ground.

950. Units held in reserve for purposes of counterattack should be assigned a definite place for formation for counterattack and approaches to the advance positions carefully reconnoitered.

Sec. VII.—DELAYING ACTION.

951. When a position is taken merely to delay the enemy and withdraw before becoming too closely engaged, the important considerations are:

If the position is taken up on open ground, the enemy should be forced to deploy early, in order to permit of a timely withdrawal. The field of fire should therefore be good at distances from 500 to 1,200 yards or more; a good field of fire at close range is less important.

The ground in rear of the position should favor the withdrawal of the first line by screening the troops from the enemy's view and fire as soon as the position is vacated. Exceptionally favorable conditions in this respect may make extensive field of fire less essential (e. g. as in woods).

952. On open ground, the defense is made by groups holding the natural strong points of the terrain, separated by considerable distances. Supports are needed chiefly for the protection of the flanks of the strong points. Reserves should be posted well in rear to assist in the withdrawal of the first line. Infantry batteries and single guns, and machine guns are especially valuable to a delaying force.

Sec. VIII.—POSITION WARFARE.

953. The general principles of defensive combat apply to the defense in position warfare. The chief peculiarities of the defense in position warfare are those due to the length of time the opposing forces remain in contact prior to the stage of decisive action. Every feature of the defense which in open warfare can only be covered by general instructions is intensively organized in position warfare.

954. The chief characteristics of the defense in position warfare are:

(1) The intensified development of all defensive works made possible by the length of time available;

(2) The vast amount of artillery of all calibers, ammunition and other matériel which the stationary character of operations permits the opposing forces to assemble;

(3) Consequent necessity for the distribution of the defensive forces in great depth, in order to avoid offering concentrated targets to the attacker's artillery;

(4) Superorganization of the service of information by means of permanent observation posts and aerial photography and consequent necessity for careful masking of all constructions;

(5) Possibility of the accurate registration of fire on objectives, which, in conjunction with the unlimited supply of ammunition, permits of the use of defensive barrages, annihilating fire on specified areas, harassing fire, interdiction fire, etc.;

(6) Detailed organization of all defensive action.

955. The defensive dispositions in position warfare comprise:

(*a*) A first position, organized in depth and preceded by an outpost zone when the main line of resistance is not located in the advanced zone of the position. This position will be on the ground where contact has already taken place with the enemy.

(*b*) A second position, chosen and occupied under the protection of the first and sufficiently distant from it to insure that it can not be taken under hostile artillery fire at the same time as the first. Intermediate positions are organized throughout the zone of depth between the two positions.

(*c*) Switch positions are organized for the purpose of maintaining the continuity of the front in case the enemy breaks through at one or several points. Switch positions are oblique to the front and usually follow the natural contour of the ground. They serve as bases for counter attack as well as to limit the effects of a hostile penetration.

956. The troops assigned to the defense of the first position comprise:

(*a*) The outpost (when an outpost zone is held);
(*b*) The combat troops;
(*c*) The reserve.

957. The line for the defense of which resistance is to be made is defined in the orders of higher commanders.

958. As a general rule, the second position is not permanently occupied. It will usually be sufficient to have a certain number of reserve units near enough to assemble at the position in case of an alert. Special units are permanently designated for switch positions during an alert.

959. The defense can not be successfully made on rigid lines of trenches. Any position that is once located can be knocked to pieces by the expenditure of sufficient ammunition. The defensive organizations must therefore be distributed over areas of such extent that they can not be destroyed or neutralized by hostile fire. Combat groups and machine guns are distributed in checkerboard fashion, occupying inconspicuous points of the terrain and located within supporting distance from each other. Well-defined targets must in no case be offered to hostile fire. Isolated woods, farms, etc., which will be subjected to heavy hostile fire should be avoided. The visible lines of the defensive system must not reveal the defensive organization. The more numerous the defenses of all kinds, the more widely they are distributed over the ground, the more effective their concealment from the enemy's air and ground observation, the more difficult it will be for the enemy to detect the most important points and to concentrate his fire on them.

960. The defense must be based upon the foreknowledge that all trenches will be subjected to the hostile preparatory bombardment. Losses will therefore often be much slighter if the troops are posted in open ground or in shell holes. The trenches and fortified points will then absorb the hostile fire and mislead the enemy. Combat emplacements should be selected for all units on these principles. Such emplacements may be to the front, to a flank, or as far as the nearest supports, to the rear, into areas which are less exposed to hostile fire.

961. The principal purpose of the trenches is in general to serve as avenues of communication and protection against weather in quiet periods. They are none the less important. Without them the fighting capacity of the troops falls off rapidly and the service of supply becomes very difficult.

962. The only forms of protection against fire, of permanent value, are dugouts and concrete shelters of sufficient depth or resistance to withstand high-power artillery. Deep dugouts in the front lines do not permit of the prompt egress of troops, and in case of attack become mere man traps. Concrete shelters in the advanced zone should be constructed wherever practicable.

Dugouts and concrete shelters are an essential means of conserving the fighting capacity of the troops. Effort should be made to accommodate all reserves in shellproof shelters. Dugouts or groups of dugouts should enable troops to be accommodated by complete units in order to facilitate command and supply.

963. The commander of each unit prepares a plan of defense and a plan of work which he transmits to his successor when relieved.

964. Special forms of increased readiness for action are provided in case indications of a hostile attack are observed. The measures to be taken comprise:

(1) Outpost and combat troops occupy their combat emplacements.

(2) Men engaged in special tasks or temporarily detached report to their units.

(3) All observers occupy their posts.

(4) Work in the battle and outpost zone ceases.

(5) Reserves (troops at rest) stand in readiness to move; wagons are loaded and horses are harnessed.

(6) All means of communication are tested and telephones are manned by officers.

Special dispositions in case of fog must be taken. The number of sentries is increased, runner chains strengthened, and the outpost garrison, if necessary, reinforced.

Sec. IX.—ANTITANK DEFENSE.

965. When an attack by tanks in force must be reckoned with, special measures for antitank defense are necessary. These comprise:

(*a*) Antitank redoubts.

(*b*) Tank traps, mines, barricades, and other obstacles.

966. Antitank redoubts are usually strong points of the general system of defense, especially equipped with the means of antitank defense and constructed with especial view to checking the advance of tanks.

The special armament of an antitank redoubt comprises machine guns using armor-piercing projectiles, light artillery pieces, and 1-pounders.

The redoubts are located along the approaches most favorable to the advance of tanks. In the distribution of antitank defenses the fact that marshes, watercourses, thick woods, and very steep slopes constitute obstacles to the advance of the tanks should be considered. A stream with a firm bottom is no obstacle unless the water is at least 4 feet deep. A deep swamp or a stream with a soft bottom is an effective obstacle.

967. Tank traps, mines, barricades, and other obstacles should be so located as to be under the close-range fire of the defense. Obstacles may be constituted by damming brooks, so as to form marshes, making slashings across roads, placing tank traps at road defiles and along forest paths, or by barricading the exit of villages. Strong bridges may be destroyed and replaced when necessary by lighter bridges. Slopes should be cut with a sharp vertical wall at least 6 feet high in the direction facing the tanks and 10 feet in the opposite direction.

In order to constitute a serious obstacle in soft or medium ground, a ditch should be at least 14 feet wide and 8 feet deep. A ditch across a road is more effective if dug at points where the ground on either side of the road is not suitable for the passage of tanks. It may be lightly bridged to take horse traffic.

968. Machine guns open heavy fire on approaching tanks, especially against the aperture through which the operator directs the movement of the tank. Infantry takes cover from the view of tanks which have penetrated the position, so far as compatible with its mission, usually giving way to one side of the line of approach. It must be prepared to resume its combat emplacements immediately after the passage of the tanks and open fire on the hostile infantry which follows them.

Sec. X.—THE PLATOON.

969. In defense, a platoon of a first-line company may be deployed as an outguard (outguard platoon, picket), as a holding garrison on the line of resistance (combat or security platoon), or as a support (reinforcing or counter attacking platoon).

970. The conduct of an outguard is described in Art. 303 et seq.

Combat Platoon.

971. Depending on the frontage assigned to it and the extent of the field of fire to the front, a combat platoon deploys for defense on one or two lines. The platoon will more frequently deploy on one line for defense than for attack. When the field of fire to the front is short and the attack can reach assaulting distance at short range under cover, deployment in two lines may be necessary. Deployment in two lines will also frequently be effective under conditions which favor the organization of tiers of fire. When deployed in two lines, the platoon can furnish protection to the flanks of the groups in the first line and offer lines of resistance to the flanks.

During continued occupation of the same position and upon approach of the enemy to close range, a change in dispositions in order to provide for all-around defense will usually be necessary.

972. The frontage assigned to the platoon may vary from 100 to 400 yards.

973. The fundamental principle of the defensive tactics of the platoon is that each section in the first line shall be so disposed as to cover its own front and flank the front of the adjacent combat group and the intervening interval; and each section in a rear line shall cover the flanks of the sections in its front and the intervals between them.

974. The platoon does not as a rule occupy its position with men spaced at equal intervals along the line. Sections, squads, and groups are located in such manner as to favor the development of frontal and flanking fire and cover the areas which are dead to the fire of the supporting machine guns.

975. The platoon leader locates the combat emplacements to be occupied by the several combat groups (sections, squads, etc.) of his platoon, in accordance with the c. c. order. The method of deployment for defense will depend upon the time available for the construction of the position. When immediate provision for cover is urgent, each combat group is deployed on the trace of its combat emplacement, and the construction of the positions commenced. A procedure of intensive digging is followed; in each combat group men are assigned tasks in pairs; each man works at maximum capacity for periods of four or five minutes, when he is relieved by the alternate man of the pair.

Platoons must be trained in rapid deployment for defense as well as for offense; squad and section leaders must be taught to dispose their units on the general defensive line of the platoon in such manner as to insure the maximum fire effect and the most advantageous use of cover.

When a more deliberate procedure may be followed, the platoon is divided into reliefs which are assigned definite tasks on which they work until completed, the remainder of the platoon being held in a position of readiness at rest.

The position must be so constructed that the platoon can cover with its fire all parts of the sector assigned to it and flank the front of adjacent units.

976. As soon as possible after the construction of the combat emplacements is completed, the platoon leader should take steps to connect them with each other and with those of adjacent units by communicating trenches. He should, as soon as possible, make provision for shelter of the platoon, affording at least protection against the weather and if practicable against the fire of light artillery. (See Fig. 33.) The subsequent development of the position and the extent of the constructions will vary with the length of time the position is occupied.

977. In each combat group auto-riflemen are so located that they can fire direct to the front and across the front of the adjacent units. (Fig. 52.) Hand and rifle grenades are used to cover any dead ground in front of the position.

978. The platoon leader ascertains the ranges to all prominent points in the foreground and prepares range cards for the use of his combat groups. He assures himself of the provision of an adequate supply of ammunition and makes provision for its storage (depots, niches).

979. The platoon leader familiarizes himself with the location and sectors of fire of the machine guns and light mortars covering his front and with the post of the nearest artillery observer.

980. The platoon leader establishes communication by runner with the command post of the c. c. and with the leaders of adjacent platoons. He sends one runner to join the c. c. He familiarizes himself with the most favorable points of observation in his own position and in those of adjacent platoons, and details an observing personnel as permanent in character as possible for the general observation service of his position. He familiarizes himself with the terrain in the foreground of his position and with the position of adjacent platoons. He instructs section and squad leaders and his men as to the details of the terrain (roads, villages, streams, ravines, woods, etc.), and informs them as to the location of platoon, company, and battalion command posts and the battalion aid station. When it is not necessary for all men to occupy combat emplacements continuously, he places such portions of his platoon as are not required for immediate duty at rest (in readiness) and maintains the readiness for action of his platoon by posting the necessary sentries. Each combat group must post at least one sentry (single or double) to insure prompt manning of its position in case of attack. One p. o. must constantly be on duty in the platoon. The platoon leader assures himself that each man is familiar with the emplacement he will occupy in case of combat or alarm and that the position can be rapidly manned.

Platoons in Support and Reserve.

981. When support platoons and platoons of reserve companies are assigned to definite combat emplacements, their action is similar to that of combat platoons. They establish contact with the platoons in their front and on the flanks. When held in a position of readiness, they provide the necessary cover and take the necessary steps to insure their readiness for action (posting of sentries and lookouts, designation of assembly positions, etc.).

Position Warfare.

982. When warned for duty in the trenches, the platoon leader inspects his platoon and assures himself that the arms, equipment, and clothing of his men are in proper condition and that the equipment of each man in respect to ammunition, reserve rations, and

kit as prescribed by orders and regulations is complete and in proper condition.

983. The relief of troops in the trenches usually takes place at night. The platoon leader makes a personal reconnaissance by daylight of the position to be held by his platoon. Accompanied by a runner, he proceeds with the c. c. to the command post of the outgoing company, studies the plan of defense of the company area, and receives the explanation of the c. c. commanding the outgoing company. He then goes with his runner and a guide furnished by the outgoing company to the post of the outgoing platoon leader and sends back his runner to the c. c. and the guide to his platoon. He receives from the outgoing platoon leader an extract of the plan of defense of the company area pertaining to the platoon position. The extract comprises:

(*a*) For a combat platoon: The precise rôle of each combat group (for example, to sweep a sector of the ground in front or to flank an adjacent element); detailed sketch of dispositions and of hostile trenches.

(*b*) For a support platoon: Combat position in case of alarm, the support to be given, or counterattack to be launched, in the cases considered in the plan of defense of the company.

(*c*) The rôle of adjacent platoons, means of communication with them and with the c. c.

(*d*) Plan of work.

984. Accompanied by the leader of the outgoing platoon, the platoon leader makes a detailed examination of the ground. He informs himself by personal inspection as to all the details concerning his position and those of adjacent platoons with whom he must maintain constant contact. He must be informed with regard to:

(*a*) Location of supporting trench mortars and their field of fire.

(*b*) Sectors of fire of machine guns covering his front and dead ground in same.

(*c*) Lie of friendly artillery and machine-gun barrage in front of his position and signals for starting and stopping the barrage.

(*d*) Lie of hostile barrage and gaps in same.

(*e*) Location, strength, and capacity of shelters.

(*f*) Defensive measures against gas attack and system of giving gas alarm.

(*g*) Location of nearest aid station and the route thereto.

(*h*) The accessory defenses and hidden passages through the barbed wire and gaps in enemy's wire.

(*i*) Conduct and habits of the enemy; strength of hostile obstacles; location of hostile posts, machine guns, and trench mortars; hostile patrol and mining activity.

(*k*) Location of nearest artillery observer.

(*l*) Points in trench system exposed to fire of hostile snipers.

(*m*) Arrangements for supply of water, small-arms ammunition, grenades, sandbags, wire, flares, etc.

985. When the platoon arrives, each combat group takes its place; the observers, the sentries, and the p. o. on guard proceed to carry out the orders for the night. In transfering his sector, the outgoing platoon leader is responsible that no man leaves his place until a man of the relief is posted and instructed as to all points in question.

986. As soon as he has taken over his position, the platoon leader reports that fact to the c. c. When so instructed by his c. c. the outgoing platoon leader orders the departure of his platoon.

Should the enemy attack during the relief, the outgoing platoon leader retains command.

987. The outgoing platoon makes its preparation for departure before the hour of the relief. All portable tools and camp matériel are taken. Grenades and cartridges in excess of the number prescribed to be carried on the person are left in the trench. The incoming platoon leader receives a list of trench stores on hand and checks up the stores transferred. The trenches, the shelters, and latrines are left absolutely clean.

988. The platoon leader informs his men regarding—

Their firing or assembly positions and duties in case of attack;

The position of platoon, company, and battalion command posts, the battalion aid station, and routes thereto;

Parts of trenches exposed to fire of hostile snipers;

Location of cartridge niches, grenade stores, latrines.

He inspects the position as soon as it has been manned by his platoon to insure that each section, squad, and group leader understands his orders and that all parts of the platoon are in readiness for defensive action.

989. As a general rule, unless obviously impracticable, the plan of defense in force at the time of relief should be continued in force during the first night of occupancy of the trenches. Based on his personal reconnaissance and observation, the platoon leader should as soon as practicable submit proposals to his c. c. embodying such changes in the plan of defense, in the location of combat emplacements, listening posts, patrol enterprises, employment of his own close-combat weapons (sniping, harassing fire), targets for artillery fire, etc., as the situation may require. When necessary, he selects the combat positions outside the trenches (shell-holes, etc.) to be occupied in case of hostile attack and decides on the method of occupying them.

990. The platoon leader requires the platoon 1st p. o. to keep a duty roster of the platoon. Details for carrying and ration parties, work, and other service, whether rendered in the area of the platoon or called for by higher authority, should be adjusted so as to allot periods of rest and of duty in an equitable manner. As a rule, each combat group details its own sentries; sentry details are made by the platoon only when all elements of the platoon are sheltered close together. Men are warned for duty and informed as to the hour when the duty is to commence. When practicable, notice boards are placed in each platoon trench on which are posted daily all orders regarding working parties and other orders affecting men in the platoon. The time at which they are to come on duty is stated.

991. One hour before daylight and at dusk, all officers and men go to their proper posts. At the afternoon formation, rifles, ammunition, and equipment are inspected, and the firing position of each man tested to see that our wire is covered. All gas-defense measures are inspected and alarm apparatus tested. At the morning formation ammunition is issued, provided there has been any expenditure during the night.

992. The platoon leader holds practice alerts and gas alarms. By this means, he insures that a hostile attack always finds the platoon in readiness for action. The alarming of the platoon, the prompt issue of the troops from their shelters, the occupation of the firing or assembly position or preparation for counterattack is practiced.

Increased readiness for action is necessary in case of fog or darkness. Prompt egress from the shelters and occupation of the firing or assembly positions is insured by posting sentries at the gallery entrances and requiring the garrison of the shelters to be assembled into groups under their squad or group leaders in the order in which they will issue from the shelter.

993. If the enemy penetrates the position of the platoon, it is the duty of the platoon leader on his own initiative and without waiting for orders to counterattack and eject him from the position. If the enemy has penetrated into an adjacent area, the platoon must counterattack with all elements not serving as a holding garrison.

994. The ability of the platoon promptly to meet a hostile attack depends on the efficiency of its sentries and observers. They must if practicable give immediate warning of any indications of assembly

of hostile troops for attack and set up the prescribed signal for delivery of annihilating fire by the artillery. In any case, they must give immediate warning when the hostile line shows itself and set up the prescribed barrage signal. The men must leave their shelters with rifles loaded and grenades ready before the enemy reaches our lines.

995. The platoon leader makes provision for heating the soup and the coffee (charcoal, solidified alcohol, etc.). He inspects the mess tins and takes all possible measures for the proper subsistence of his men. Ration parties carry back unserviceable material, empty cartridges, and the weapons of the killed and wounded and turn them in at the proper depot (see par. 1029).

Cartridges not issued to men are stored in niches located at suitable points along the trench. Empty cartridge cases are collected in a platoon depot. Grenades and rockets are placed in sandbags in lots of 10–20 and stored in niches established at suitable points (vicinity of sentry posts, barricades, etc.). Tools and trench matériel not in actual use are stored in a small platoon matériel depot.

996. The helmet is always worn, and gas mask carried in the alert position. In a first-line company, the men are always under arms, tools on the belt, the pack, canteen, and blanket set in order in the shelter; rifles are not loaded, the magazine is filled, cut-off up, and safety lock at the ready. Rifles are cleaned and oiled daily and after a gas attack.

997. The routine duties of the platoon leader are:

Distribution and supervision of guard and labor duty of his platoon;

Development of his position in accordance with a progressive plan of work (trenches, accessory defenses, etc.);

Continuous personal reconnaissance of the hostile position;

Upkeep and improvement of shelters;

Holding of practice alerts;

Upkeep of alarm apparatus;

Provision for suitable storage of combat matériel;

Attention to maintenance in condition of arms, ammunition, tools, equipment, clothing, etc.;

Maintenance of cleanliness and sanitary condition of his area;

Supervision of proper subsistence of his men;

Replenishment of ammunition;

Daily inspection of position, arms, guard service, etc.

He at once communicates to the c. c. and adjacent platoons any change in his own or the hostile position.

998. The platoon leader keeps the platoon 1st p. o. informed as to all the defensive measures of the platoon so that the latter may be able to take his place in case he becomes a casualty.

999. The duties of the platoon 1st p. o. are:

To replace the platoon leader when the latter becomes a casualty;
To familiarize himself with the plan of defense of the platoon area;
To keep a roster of men for various duties;
To supervise the assembly and assignment of fatigue parties;
To allot men to shelters;
In general to supervise the interior economy of the platoon (subsistence, sanitation, care of equipment and stores, execution of standing orders).

Sec. XI.—THE COMPANY.

1000. A first-line company usually deploys for defense in three echelons: (1) An outguard; (2) combat or security echelon; (3) support.

It may deploy with an outguard varying in strength from a squad to a platoon, a combat or security echelon of two or three platoons, and one or two support platoons. The strength of the outguard largely depends on the facilities for observation; it will be greater in close country or at night than in open country or by day.

1001. As a general rule, the outguards of the position are furnished by the first-line companies. A platoon is usually designated to furnish the outguards and patrols required for the front of the company. In some cases, two or three platoons may be deployed in depth abreast, each furnishing the outguards for its own front. The particular method to be employed will depend upon the facilities for communication between the line of observation and the line of resistance, and the frontage assigned to each platoon. Where the frontage assigned to each platoon is considerable and good approach trenches connect the line of observation with the line of resistance, the outguards may be furnished by platoons; unity of command may sometimes be more efficiently served in this way.

Combat Company.

1002. The c. c. assembles his platoon leaders on the position to be occupied by the company; states available information relative to the enemy and supporting troops and whether the front is protected by covering detachments; points out the line of resistance, and the sections of the battalion and the company, and those of adjacent units; indicates the location and sectors of fire of the supporting machine guns; assigns platoons to the combat echelon or as supports and details an outguard; assigns sections of the line of resistance to combat platoons and indicates the combat emplacements to be constructed and the location of cover trenches for supports; prescribes such details relative to the trace of works to be constructed as may be necessary and practicable; details working parties for construction of an obstacle in front of the position when such detail has not been made by the bn. c. and for such other purposes as may be immediately necessary; states the location of the combat train, the battalion aid station, and his own combat post.

1003. If practicable, the cover trenches for supports are so sited as to be capable of covering the flanks of the combat platoons and of eventually being connected with them by approach trenches so as to form a closed work capable of all-around defense.

The c. c. selects and fortifies an observation post giving him the best possible view over his position.

1004. The c. c. supervises the construction of the fire trenches of the combat platoons. He insures that combat emplacements are so sited that platoons can mutually support each other by flanking fire and that all dead spaces in the bands of machine-gun fire are covered.

1005. After the combat emplacements, cover trenches, and obstacle have been completed the c. c. makes provision for the construction of approach and communicating trenches, connecting fire trenches with each other, with the support trenches, and with the trenches of adjacent companies. He prescribes the construction of such lateral lines of defense, including obstacles, as are necessary.

1006. The post of the c. c. is usually with his support or between them and the combat platoons.

Reserve Companies.

1007. When reserve companies are assigned to the defense of a reserve line, their action in deploying for defense and in the construction of the position is similar to that prescribed for combat companies. Reserve companies are so disposed as to check and throw back by counterattack hostile elements which succeed in penetrating the line of resistance. C. c's. reconnoiter the section of the line of resistance in their front and maintain contact with the c. c's. of combat companies. They must be prepared to support the units on the flanks of the battalion as well as the first-line companies of their own battalion.

When held in a position of readiness, measures must be taken to insure the prompt assembly of reserve companies in case of hostile attack (posting of lookouts, designation of assembly places, etc.).

Position Warfare.

1008. The provisions of these regulations relative to the conduct of the platoon in position warfare apply in large measure to the company.

1009. The c. c. prepares the plan of defense of the company area with a sketch of his dispositions and copies of orders for the combat groups. He selects the officer on watch and prescribes the patrolling to be carried out. He selects and fortifies an observation post and details a permanent observing personnel for manning it. He maintains communication with the bn. c. and adjacent companies by visual signaling, runner, or other method. He maintains communication with his platoons by runner. He keeps in personal touch with trench-mortar and machine-gun units covering his position. He sees that all concerned are familiar with the method of calling for barrage, and insures close contact between his observers and the forward observers of the artillery in his area.

1010. The c. c. studies the possibility of the execution of raids against the hostile position and makes proposals regarding them and the support required (artillery, machine-gun, trench-mortar) to the bn. c.

1011. The c. c. makes plans for employment of his support platoons for counterattack under various assumptions as to hostile penetration into his area or the area of adjacent companies. The supports must be so located that they can advance against the point of penetration without loss of time. The counterattack should if practicable take the enemy in flank. Depending on the circumstances, it may be made through the trenches or over open ground.

1012. Barrage fire is requested by the command post (telephone, rockets) as soon as it is informed of the launching of a hostile assault. In default of other information, the c. c. and the bn. c. ask for barrage and launch the counterattacks as soon as they perceive that the range of hostile artillery has been lifted.

1013. The c. c. makes daily inspections of his sector, corrects deficiencies, and sees that all leaders are familiar with their duties in the execution of the plan of defense. He holds the officer on watch responsible for the efficient performance of the guard duty of the sector and requires him to make frequent inspections to insure the vigilance of sentries and their familiarity with their duties.

Sec. XII.—THE BATTALION.

1014. The battalion is usually reinforced for defensive combat by a machine-gun company, one or more sections of light mortars and 1-pounders, and one or more light-artillery pieces.

1015. When the deployment is not covered by other troops, the bn. c. details a covering detachment (march outpost) to protect the occupation of the position or directs the companies to send out outguards or patrols.

1016. When practicable, the bn. c. accompanied by the c. c. of the machine-gun company determines on the sectors of fire of the machine guns and fixes their location in such manner that they cover the entire front of his position and flank the front of adjacent units with continuous bands of fire and are at the same time capable of delivering long-range overhead fire over the combat echelon. He determines on the general lie of the obstacles in such manner as to arrest the hostile attack under the flanking fire of the machine guns. He determines the natural strong points of his section and fixes the combat emplacements of his first-line companies accordingly.

The bn. c. assembles the c. c's. of his companies on the position, communicates the information obtained regarding the enemy and supporting troops, indicates the line of resistance and the sections of the regiment, the battalion, and adjacent units, and the location and sectors of fire of supporting machine guns; designates companies as combat companies or reserve, assigns them to sections of the battalion position or positions in readiness, and indicates the combat emplacements to be constructed. He prescribes the direction toward which the trenches should face or fixes their direction by the assignment of sectors of fire to the combat companies. He prescribes such details relative to the trace of field works as the time available may permit and situation requires. He prescribes the location of 1-pounders and artillery pieces and assigns them missions as required by the situation. He fixes the location and field of fire of the light mortars in such manner as to cover the dead spaces in the bands of machine-gun fire and other important dead spaces. He details working parties for clearing the field of fire, the construction of the obstacles, his message center, command post, and observation post, and such other purposes as may be immediately necessary. He details the necessary carrying parties and states the location of the combat train, ammunition and supply depots, battalion aid station, and his own combat post or message center.

1017. The bn. c. supervises the construction of the position. He insures that the combat emplacements of the companies are so constructed that they cover the dead spaces in the bands of machine-gun fire and that they mutually flank each other and the front of adjacent units. He details such parties from the reserve companies to assist in the construction of the works on the line of resistance as are not required for the construction of cover for the reserves. When provision has been made for the construction of the most essential features of his position, he details further working parties for the construction of approach trenches to his combat companies. He prescribes the construction of such dummy trenches as the situation permits.

1018. When natural cover for the protection of reserves is not available and it is necessary to construct cover trenches, such trenches, should when practicable, be so constructed as to form a reserve line on which penetration at isolated points may be checked.

1019. In addition to their flanking field of fire, machine guns should, when practicable, be so sited that they can take the attacker under fire at long range. Positions which permit of long-range fire from concealment (thickets, etc.) are especially favorable, as they prevent the premature destruction of the machine guns by hostile artillery. A certain proportion of machine guns should, if practicable, be echeloned in depth in rear of the line of resistance in such manner as to be able to take hostile elements penetrating the line of resistance under flanking fire and deliver long-range fire over the line of resistance or through the intervals between supporting points. Alternative positions should be selected. In order that the fire of the greatest possible number of machine guns may be concentrated at any point on the front of the position, they should be so sited that they have as large a field of fire as possible.

Infantry groups are detailed when necessary for the close protection of machine guns.

It will often be advantageous to place the tracing of the obstacle in front of the position under the direction of the captain of the machine-gun company.

1020. The bn. c. establishes a visual central in the vicinity of his message center and insures that companies establish connection with it. He maintains communication with his companies and with adjacent units and the rear by visual signaling, runners, mounted orderlies or cyclists, and such other means as may be furnished him.

1021. The chief mission of the reserve companies is to support the combat troops by counter attack in case of penetration of the line of resistance. A definite place of formation for counter attack should be assigned them and the best approaches to the front carefully reconnoitered. In order to insure the timely intervention of reserves, it may sometimes be advisable to assign each reserve company a definite sector against which it will launch its counter attack without waiting for orders, in case of hostile penetration.

1022. The regulations governing ammunition supply in offensive combat (pars. 796 et seq.) apply in principle to the defensive. The relative absence of movement on the defensive permits, however, of the establishment of depots of ammunition and other supplies. Such depots are established in the fighting emplacements of platoons and at the battalion ammunition and supply point. During combat, ammunition and other supplies are transported to combat companies by carrying parties attached to combat battalions from the regimental reserve. During periods of stabilization, carrying parties for ammunition, rations, and supplies may be detailed from the battalion reserve. In all cases the battalion is responsible for the delivery of supplies from its depots or supply point to its combat companies.

Position Warfare.

1023. The battalion may be employed as first-line battalion, second-line battalion, or reserve.

1024. A first-line battalion is employed as an outpost battalion or combat battalion, depending on whether the principal resistance is to be offered in the advanced zone or in the zone of the battalion in second line. Depending on the same condition, the second-line battalion is employed either as a combat battalion or as support to the first-line battalion.

When it is not intended to offer the principal resistance in the zone of the first-line battalion, it will frequently be advisable to withdraw one or two companies of the battalion and place them at the disposition of the commander of the combat troops or in reserve.

1025. The higher command determines the zone in which the principal resistance is to be offered.

First-line Battalion.

1026. When employed as an outpost, the first-line battalion is deployed into support and reserve companies. Support companies (security echelon) furnish the outguards (pickets, sentry squads, cossack posts) and patrols for the front of the battalion. When employed as combat battalion (main line of resistance in advanced zone), the first-line battalion is deployed into combat companies and reserve.

1027. The bn. c. of the first-line battalion supervises the service of information in his sector. He insures the prompt release of the barrage, the alarming of all parts of his battalion and the second-line battalion, and notification to the rg. c. and adjacent sectors in case of hostile attack.

1028. An artillery representative acts as advisor to the bn. c. in artillery matters and arranges for the cooperation of the supporting artillery. He maintains communication with the artillery commander by the use of his own personnel and materiel. The bn. c. insures prompt reports from his subordinates with a view to bringing down artillery fire on transient objectives (working parties, reliefs, etc.). He holds practice alerts to insure the readiness of his battalion in case of gas or other attack. He orders such patrolling and organizes his observation service in such manner as to assure himself of constant accurate knowledge of the hostile position and hostile activity. He maintains close contact between all parts of his position and with adjacent sectors. He directs the development of the position in accordance with the plan of work established by the rg. c. He is responsible for the maintenance and replenishment of the ammunition supply in his battalion. He inspects his area and assures himself as to the efficient performance of duty of all parts of his battalion.

1029. The supply officer of the first-line battalion is responsible for the delivery of rations from the company kitchens to the platoons of the first-line companies. He is in charge of the company kitchens of the first-line companies and is furnished details for carrying parties from the battalion reserve or other rearward echelon.

Second-line Battalion.

1030. When employed as support to the first-line battalion, it is the duty of the battalion in second line in case of hostile penetration of the advanced zone to eject the enemy by immediate counterattack without waiting for orders. The bn. c. reconnoiters the advanced zone with his c. c's., familiarizes himself with the details of the position, acquaints himself with the lay of the hostile barrage and the principal shelled areas, and determines the best approaches to the advance zone. He is responsible that the counterattack is delivered before the enemy is able to establish himself in the captured position.

1031. In order to insure prompt launching of the counterattack, it will frequently be necessary for the bn. c. to assign to his c. c's. zones of action within which they are responsible for the prompt delivery of the counterattack without orders from the bn. c.

After the delivery of the counterattack the bn. c. takes steps to reorganize his battalion and redistribute it in depth.

Reserve Battalion (at Rest).

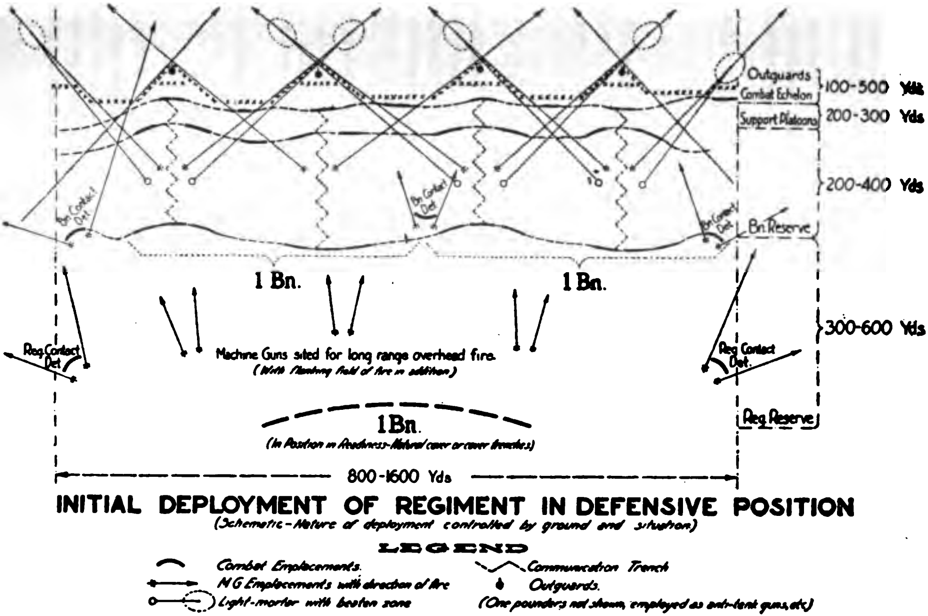
1032. The reserve battalion utilizes the period of rest for the physical refreshment of the men, overhauling weapons and equipment, and instruction. The bn. c. makes detailed provision for the alarming and formation of the battalion in case of hostile attack (see par. 964).

Sec. XIII.—THE REGIMENT.

1033. The regiment deploys for defensive combat with one or two battalions in first line and two or one battalions in reserve (Fig. 4c). Exceptionally, all three battalions may be deployed abreast.

1034. The attachment of machine-gun companies, light-mortar, and one-pounder sections, and artillery pieces to battalions is made in accordance with the same principles as in the attack.

1035. The rg. c. designates his battalions as combat battalions and reserve. He assigns sections of the line of resistance to his combat battalions and positions in readiness to reserve battalions. He details contact detachments for reinforcing the defense on the boundaries of his sector. He details such working and carrying parties from his reserve to assist in construction of works on the line of resistance and approach trenches as are necessary and not required for the construction of cover for their own protection. He locates his observation station, message center, and command post, and establishes communication (telephone, buzzerphone, runners, etc.) with his battalions and adjacent units. He employs his pioneer platoon for the construction of observation posts and shelter for his message center and command post. He allots matériel and personnel of the pioneer platoon, attached engineer units, and signal troops to his battalions. He supervises the tactical disposition of



INITIAL DEPLOYMENT OF REGIMENT IN DEFENSIVE POSITION

(Schematic—Nature of deployment controlled by ground and situation)

Outguards
Combat Echelon
Support Platoons
Bn. Reserve
Reg. Reserve
100-500 Yds
200-300 Yds
200-400 Yds
300-600 Yds
Bn. Contact Det.
Bn. Contact Det.
Bn. Contact Det.
Reg. Contact Det.
Reg. Contact Det.
1 Bn.
1 Bn.
Machine Guns sited for long range overhead fire.
(With flanking field of fire in addition)
1 Bn.
(In Position in Readiness—Natural cover or cover trenches)
800-1600 Yds
LEGEND
Combat Emplacements.
M G Emplacements with direction of fire
Light-mortar with beaten zone
Communication Trench
Outguards.
(One pounders not shown, employed as anti-tank guns, etc)

FIG. 20.

the troops and the construction of the position. He arranges for the support of the divisional artillery. He directs and supervises the service of supply of the regiment, and establishes depots of engineer matériel, ammunition, and other supplies. He establishes the regimental first-aid station.

1036. When the front is not covered by other troops, the rg. c. prescribes such distant reconnaissance and details such combat patrols as may be necessary. He prescribes the construction of dummy works to be located in advance of the position.

1037. Engineer troops assigned to a position work under the direction of the local commanders (regimental and battalion).

Position Warfare.

1039. The rg. c. draws up the plan of defense of his sector. It is his duty to develop the sector for combat, shelter, and the maintenance of the health of the troops. He draws up a plan of work which he turns over to his successor on relief. He regulates internal reliefs within his regiment in accordance with the arduousness of the service and with a view to maintaining the maximum fighting efficiency of the regiment.

1040. The rg. c. prepares maneuver grounds, obstacle courses, and target ranges near the shelters of his resting battalion, and supervises the instruction of resting troops. He devotes especial attention to the instruction of his officers and p. o.'s and prepares tactical exercises for the troops, giving especial attention to exercises in open warfare.

1041. When the regiment is deployed over two zones of resistance, the rg. c. fixes the boundaries between the zones of the first and second line battalions. All machine guns, light mortars, and one-pounders in the zone of each battalion are under the orders of the corresponding battalion commander.

1042. The rg. c. fixes the direction of circulation in his sector by the designation of in and out trenches.

Sec. XIV.—THE BRIGADE.

1043. The provisions of these regulations relative to the deployment of the brigade for attack apply in principle to the defense.

1044. The brigade commander assigns missions (sections of line of resistance or sectors of his defensive area) to his regiments, allots them the necessary quotas of auxiliary troops, and retains a reserve (infantry, machine guns, etc.) under his direct control and prescribes its location. He details contact detachments for the purpose of reinforcing the defense of the position on his sector boundaries. He supervises the tactical dispositions of the troops and the construction of the position. He maintains close contact with the divisional artillery with a view to effective artillery support of the defense of the position. He requires commanders of reserve units to make detailed reconnaissance of the position and that of adjacent units in order to insure their effective intervention when their support is called for. He employs his reserve machine guns and attached artillery in support of the combat troops. He orders such distant reconnaissance and combat patrolling as the situation may require. He locates his observation station, message center, and command post in such manner as to permit of the most effective observation and communication during combat. He must at all times be in such close touch with his reserve that he can engage it in a timely manner. He maintains close touch with the division at all times.

Miscellaneous.

1045. The regulations for intercommunication on the offensive (paragraphs 844 et seq.) apply in principle to the defensive. The means of intercommunication at the disposal of regiments is usually considerably reinforced by attachment of divisional signal troops and personnel, and wire communication is extended to include the battalion, and, if practicable, the company.

The regulations relative to infantry and airplanes (paragraphs 550 et seq.) in offensive combat apply also to the defensive.

CHAPTER VI.

SPECIAL OPERATIONS.

Sec. I.—NIGHT OPERATIONS.

1046. The object of night operations may be to effect a secret concentration before an attack; to gain time; to effect an approach to a hostile position with a view to launching an attack at daybreak; to cross a zone made impassable by hostile fire by day; to effect a withdrawal; to deliver an attack; to execute a reconnaissance; or (in position warfare) to effect a relief, execute works under the cover of darkness, or bring up supplies on roads under hostile observation.

1047. Night operations are characterized by:

(*a*) Decrease in the effectiveness of aimed fire and corresponding increase in the importance of the means of close combat, of the defensive fire of fixed weapons that can be laid on a definite line of fire by day (machine guns), and in general of the importance of movement.

(*b*) Difficulty in the maintenance of control and of contact and communication between units, with consequent necessity for close formations. Decrease in the effectiveness of fire permits of dense formations.

(*c*) Difficulty in the maintenance of direction and consequent necessity for the limitation of objectives.

(*d*) Highly sensitive morale of troops with consequent increase in the importance of the effect of surprise on the part of the offense and of the service of security and the preparation of ambushes on the part of the defense.

1048. Night marches must be carefully prepared. The column must be kept well closed up, advance and rear guard distances greatly reduced, guides stationed at cross roads to prevent the wrong route from being taken, strict march discipline maintained, and a moderate rate of march observed. Numerous connecting files should be provided. When practicable, night concentrations should be effected by motor transport. Daybreak should find the troops either in position or in concealed localities (woods, villages) and trains under cover.

In movement off roads, the route should be carefully laid out by compass bearings and the march directed by means of illunimated compasses.

In night marches where protection against the reconnaissance or attack of hostile airplanes making use of flares must be provided, special precautionary measures are necessary. The command should march in small units and avoid main routes, taking secondary routes as far as practicable. No assembly of troops should be permitted to take place at railway stations. When a unit is illuminated, it should stop, keep to the side of the road, and remain motionless.

1049. Long night marches should be made only over well-defined routes. March discipline must be rigidly enforced. The troops should be marched in as compact a formation as practicable, with the usual covering detachments. Advance and rear guard distances should be greatly reduced. They are shortest when the mission is an offensive one. The connecting files are numerous.

The ground to be traversed should be reconnoitered by daylight, and if practicable, at night. Features that are distinguishable at night should be carefully noted, and their distances from the enemy, from the starting point of the troops, and from other important places should be made known.

The most favorable time for beginning the reconnaissance is shortly before dusk, so that both the day and night aspects of the terrain may be studied.

The approaches should be staked out as far as practicable or outlined by luminous tape.

Troops attacking at night can advance close to the enemy in compact formations and without suffering loss from hostile artillery or infantry fire. The defender is ignorant of the strength or direction of the attack.

A force which makes a vigorous bayonet charge in the dark will often throw a much larger force into disorder.

A night advance made with a view to making an *attack* in the course of the following day usually terminates with the hasty construction of entrenchments in the dark. Such an advance should be so timed as to allow an hour or more of darkness for entrenching.

An advance that is to terminate in an *assault* at the *break of day* should be so timed that the troops will not arrive long before the assault is to be made; otherwise the advantage of surprise will be lost, and the enemy will be allowed to reinforce the threatened point.

1050. A night attack may be delivered with a view to carrying important points necessary for the offensive of the following day or to the driving in of outposts. In the pursuit of a defeated force which seeks to cover its withdrawal by weak forces heavily equipped with machine guns, a night advance will often offer a means of avoiding the disproportionate losses incident to a daylight advance, and permit the attacker to close with the retreating force.

The time of night at which the attack should be made depends upon the object sought. If a decisive attack is intended, it will generally yield the best results if made shortly before daybreak with a view to following up immediately the success obtained and exploiting to the maximum the effect of surprise. If the object is merely to gain an entrenched position for further operations, an earlier hour is necessary in order that the position gained may be entrenched under the cover of darkness. Moonlight is especially favorable to a night attack, as it greatly facilitates movement without materially increasing the efficiency of fire.

Orders must be formulated with great care and clearness. Each unit must be given a definite objective and direction, and care must be exercised to avoid collision between units. A distinctive badge (e. g., white arm band) should be worn. The conduct to be observed by each unit on carrying its objective should be prescribed.

Preparations must be made with secrecy, with a view to effecting as complete a surprise as possible. All possible precautions are taken; arms and equipment are secured so as to make no noise; silence is strictly enforced; the use of whistles is prohibited; orders are transmitted by agents in a low tone. Bayonets are fixed but pieces are not, as a rule, loaded.

When the movement is started, and not until then, men should be acquainted with the general design, the composition of the whole force, and should be given such additional information as will insure cooperation and eliminate mistakes.

During the movement every precaution must be taken to keep secret the fact that troops are abroad.

Unfriendly guides must frequently be impressed. These should be secured against escape, outcry, or deception.

An attack once begun must be carried to its conclusion, even if the surprise is not as complete as was planned or anticipated.

1051. The formation for attack must be simple. It should be carefully effected and the troops verified at a safe distance from the enemy. The attacking troops should be formed in compact lines and with strong supports at short distances. The reserve should be far enough in rear to avoid being drawn into the action until the commander so desires.

Darkness causes fire to be wild and ineffective. The attacking troops should march steadily on the enemy without firing, but should be prepared and determined to fight vigorously with the bayonet.

In advancing to the attack the aim should be to get as close as possible to the enemy before being discovered, then to trust to the bayonet.

Units are usually formed for attack in small columns (sections or squads). In each platoon, these columns are usually formed in depth, each being assigned the same objective and following the same route. They should follow one another at such distance (about 50 yards) that no two will be caught in the same ambush. The leading unit of each column acts as a covering detachment; it *is* usually preceded by two or three scouts. The advance will usual*ly* be effected by short bounds; at each halt, scouts reconnoiter for the next advance. Halts should be of the shortest possible duration; rapidity is an essential element of the success of a night atttack. As soon as a hostile post is discovered, it is rushed with fixed bayonets. If the advanced element falls into an ambush, the rearward columns move out toward the flank and endeavor to pass it. If this is impracticable, they rush the hostile resistance without hesitation; delay after the attack is discovered is fatal.

In all cases, the attack is carried out with the bayonet without firing.

After each attack, the unit engaged is re-formed before initiating a further advance.

Immediately after the capture of the objective, the position must be rapidly organized with a view to checking counterattacks.

In position warfare, the intensified organization of obstacles and machine-gun defense usually limits night attacks to raids by small units.

1052. The principal means of defense against night attack are:

(*a*) The fire of fixed weapons and grenades.

(*b*) Obstacles.

(*c*) Illumination of the foreground.

(*d*) Counterattack.

(*e*) Patrols and outguards.

1053. On the defense, preparations to resist night attacks should be made by daylight whenever such attacks are to be feared.

Obstacles placed in front of a defensive position are especially valuable to the defense at night. Many forms of obstacles which would give an attacker little concern in the daytime become serious hindrances at night.

After dark strong patrols should be pushed to the front.

These defensive elements are so combined as to take the attacking forces by surprise. Ambushes are created by constructing obstacles along the most probable lines of hostile advance (roads, paths, etc.), and these are swept by the fires of fixed weapons sited to a flank or to the rear. The obstacles should be so concealed that the enemy will not discover them before falling into them. While the attacker is held up in front of the obstacle, the fixed weapons open a heavy fire with a view to checking his advance and giving the alarm to troops in rear. The latter at once advance to counterattack with the bayonet in such manner, if practicable, as to take the attacking troops in flank. Supports and reserves should be posted with this object in view or with a view to recapturing the position if lost. The distance of supports and reserves should be greatly reduced. Outguards provide for the security of the command; when practicable, they prepare ambushes in advanced positions with a view to breaking up an attack before it reaches the defensive position or to capturing hostile patrols.

The use of star shells is most important in disclosing the position of hostile troops. When employed they must be projected behind the enemy's line, otherwise they mask his movements and make him invisible to the defenders.

In the use of artificial illumination, care must be taken that the location of the defensive position is not revealed.

Especial vigilance must be maintained shortly before daybreak and on moonlight nights.

Preparations to resist night attacks should be made by daylight whenever such attacks are to be feared.

Reserve units must be able to form rapidly at designated assembly positions and proceed therefrom along previously reconnoitered routes to any part of the front where they may have to intervene.

When it is learned that the enemy is approaching, the trenches are filled and the supports moved close to the firing line.

Supports fix bayonets, but do not load. Whenever practicable and necessary they should be used for counterattacks, preferably against a hostile flank.

The defender should open fire as soon as results may be expected. This fire may avert or postpone the bayonet combat, and it warns all supporting troops. It is not likely that fire alone can stop the attack. The defender must be resolved to fight with the bayonet.

Ordinarily fire will not be effective at ranges exceeding 50 yards.

A white rag around the muzzle of the rifle will assist in sighting the piece when the front sight is not visible.

1054. Offensive and defensive night operations should be practiced frequently in order that troops may learn to cover ground in the dark and arrive at a destination quietly and in good order, and in order to train officers in the necessary preparation and reconnaissance.

Troops should be trained in the necessary details (night movements, night patrolling, night marching, and communication at night, see paragraphs 159, 926–938).

1055. Only well trained, thoroughly disciplined troops should be employed in a night attack.

Poorly disciplined and untrained troops are unfit for night attacks or for night operations demanding the exercise of skill and care.

Sec. II.—COMBAT IN WOODS.

1056. Combat in woods partakes in a lesser degree of many of the characteristics of night combat. These are: decrease in the effectiveness of fire; increase in the importance of close combat and surprise; difficulty in the maintenance of direction, communication, and cohesion of the troops; effectiveness of ambushes; ineffectiveness of aerial observation.

Woods lend themselves to gas concentrations.

They are especially favorable to delaying actions by relatively small forces. They keep the attacker in ignorance of the strength of the forces confronting him.

1057. The attack of a woods comprises three general phases:

(*a*) The advance over open ground to the edge of the woods;
(*b*) The advance through the woods;
(*c*) Egress from the woods.

1058. The main general feature of the situation during the advance over open ground to the edge of the woods lies in the fact that the defender sees all the movements of the advancing troops while his own position is concealed. When wind and atmospheric conditions are favorable, this advantage may be neutralized by the use of smoke screens; or the approach to the edge of the woods may be effected at night.

1059. The edge of the woods should be carried like any other position and employed as a departure position from which the advance through the woods is organized and launched. If the attacker attempts to advance uninterruptedly through the woods without reorganizing at the edge of the woods, great inequality in the advance of different parts of the line will unavoidably result, and the more advanced elements will be exposed to being taken in flank by the prepared ambushes of the defense.

1060. In general, the advance through the woods should be methodically organized with a view to maintaining cohesion between the attacking units. The movement should be effected in a series of bounds, with halts to restore contact and cohesion either on certain predetermined lines or at prescribed periods. Paths or roads perpendicular to the line of advance are especially useful for this purpose.

Direction must be carefully maintained by means of compass bearings.

Especial measures for maintaining contact with units advancing on the flank outside the woods must be taken (strong combat patrols with machine guns).

1061. The formation to be adopted depends upon the density of the woods. In sparse woods, formations resembling those employed on open ground (close line of skirmishers) are generally most suitably the leading elements. In dense woods, the conditions more closely resemble those of night operations, and similar formations will be most effective (section or squad columns disposed in depth and preceded by scouts). Supports should closely follow the assaulting units. Connecting files maintain contact between adjacent columns and between rearward and leading units.

1062. Absolute silence must be maintained throughout the advance. Sound signals must as a rule be prohibited. When necessary, the line is marked for airplanes by Bengal flares. Rocket signals are used to indicate arrival on important terrain lines.

1063. The rate of the advance depends largely upon necessity for reconnaissance and other security measures, and is necessarily slower than on open ground.

Scouts reconnoiter to the front and flanks of the advancing columns, remaining within sight of their units. As soon as the scouts have indicated that all is clear, the platoon or section advances, and the scouts move forward for further reconnaissance.

If the scouts discover a hostile post, the leading columns rapidly form skirmish line facing it, and the post is rushed without hesitation. Rearward columns move to one side of the line of advance with a view to taking the hostile resistance in flank or checking a counterattack against the flanks of the leading columns.

1064. Especial care must be taken when scouts discover an obstacle across the line of advance. Reconnaissance toward the front and flanks must be carried out with a view to the discovery of any hostile post located with a view to sweeping the obstacle with frontal or flanking fire.

1065. Especial provision for the protection of its flanks must be made by any unit which advances so far beyond adjacent units that its flanks are unsupported. Reconnaissance must be pushed sufficiently toward the flanks to insure that the advancing columns will not be taken under flanking fire.

1066. Special precautions must be taken before debouching in clearings or on wide roads.

When advancing along a road or path, the leading columns should halt at all turns until the reconnaissance of scouts has progressed sufficiently to insure the safety of the column.

1067. Before debouching from the far edge of the woods, the columns should halt and re-form far enough within the interior of the woods to be beyond the enemy's view. The position to be occupied after debouching should be reconnoitered. Machine guns and accompanying weapons should be brought up and posted so as to cover the egress. If the situation is such that heavy fire from hostile artillery registered on the edge of the woods may be expected as soon as the units commence to debouch, the movement should be carried out in a single rush and by surprise. When greater danger is to be apprehended from close combat weapons than from artillery, the egress may be effected by infiltration; automatic riflemen rapidly build up a thin line on the new position, and under the cover of their fire, the rest of the units forms up on the new position.

1068. The method of defense in woods are similar to those in night defense.

The defense aims to take the attacking units under flanking fire and by surprise. It therefore makes extensive employment of prepared ambushes. By the establishment of carefully concealed strong points and obstacles at intervals along the front in the interior of the woods, it endeavors to break up the continuity of the attacking line. Ambushes, echeloned to the rear of the strong points, are so established as to take under flanking fire hostile elements penetrating through the intervals between the strong points. Obstacles are constructed in rear of the intervals in such manner as to hold the penetrating elements under the fire of the troops in ambush. Supports and reserves are so posted as to take in flank by counter attack hostile elements held up in front of the strong points or penetrating through the intervals. Roads and paths are swept by the fire of machine guns and automatic rifles.

1069. The advanced line of strong points should be established at a short distance from the edge of the woods. Tiers of fire may be created and the field of fire extended by posting sharpshooters and machine guns in trees. Arrangements for flanking the edge of the woods should be made. The defense of clearings is similarly organized.

1070. Sound signals are employed by the defense to give warning of the enemy's approach.

1071. Woods are especially favorable to covering a withdrawal as they force the pursuer to a deliberate advance. A weak rear guard can delay the advance of large hostile forces until the main body has withdrawn beyond reach of pursuit. By its movement in withdrawal a skillfully handled rear guard can often attract the enemy in a direction favorable to counter attack.

1072. Troops must be carefully trained in the maintenance of direction in woods. Exercises in which widely separated units are assigned a common rendezvous at the far edge of the woods should be held for training in keeping direction by compass bearings.

Sec. III.—WITHDRAWAL.

1073. When it is no longer possible to give the action a favorable turn and the necessity for withdrawal arises, every effort must be made to place distance and a rear guard between the enemy and the defeated troops.

1074. A withdrawal by daylight involves such heavy losses and so great a degree of disorganization that it is as a rule preferable to hold out at all cost until nightfall and effect the withdrawal under the cover of night. Rearward echelons only can as a rule be withdrawn by day.

Any order for withdrawal from an uncertain source must be disregarded. Orders for withdrawal are especially suspicious when passed along a line of skirmishers.

1075. If an intact reserve remains it should be placed in a covering position, preferably on a flank, to check the pursuit and thus enable the defeated troops to withdraw beyond reach of hostile fire.

1076. The steps involved in withdrawal are in general:

(*a*) Selection of a covering position for supports and reserves.

(*b*) Selection of an assembly position where the several units will assemble when withdrawn and form in column of route; or of a defensive line on which resistance will be renewed.

(*c*) Withdrawal of transportation and evacuation of such stores as can be removed and destruction of unremovable supplies.

(*d*) Withdrawal of rearward echelons (supports and reserves) to the covering position.

(*e*) Withdrawal of the combat echelon.

1077. If the general line is divided, by terrain or by organization, into two or more parts, the firing line of the part in the least danger from pursuit should be withdrawn first. A continuous firing line, whose parts are dependent upon one another for fire support should be withdrawn as a whole, retiring by echelon at the beginning of the withdrawal.

1078. When the withdrawal takes place by day, troops in the first line are withdrawn by successive echelons and placed in reserve as soon as the supports and reserves have occupied the covering position. The fire of the echelons remaining in position, the overhead fire of machine guns and artillery, and the use of smoke screens are the most effective means of covering the movement of the withdrawing troops.

1079. When withdrawal is effected at night, supports, reserves, and the greater part of the combat echelon are successively withdrawn to the covering or the assembly position. The front lines are held by weak elements, which by simulating great activity (heavy firing from different positions, reconnaissances of strong combat patrols, numerous flares and rockets), endeavor to create the impression of heavily held lines. These advanced elements are withdrawn toward daybreak, leaving the position vacant.

The movement in withdrawal takes place in small columns (sections or platoons) which pass the covering position and move toward the designated rendezvous. Platoon and company organization should be restored during the movement so that battalions will be well in hand on reaching the assembly position.

1080. The covering position should be far enough to the rear to prevent the troops occupying it from being influenced by the withdrawal but sufficiently near to exert an influence on the action as soon as the withdrawal begins (1,000–3,000 yards). It should give the covering troops a good field of fire at mid and long ranges and should facilitate their own safe and timely withdrawal. The selection of other successive covering positions in rear of the first may become necessary.

1081. The route to be followed by each unit in reaching the assembly position should be prescribed. Guides should be furnished when necessary.

1082. Routes must be cleared by the timely movement of all transportation.

1083. The strength of the troops on the covering position should be as small as possible. They should be plentifully supplied with machine guns and infantry guns (artillery pieces). These remain in position until the last moment, if necessary; the infantry guns fire over open sights against the advancing enemy.

1084. The assembly position should be far enough to the rear to enable the advanced lines to free themselves completely from contact with the enemy and insure sufficient time for undisturbed reorganization. When practicable, this position should be protected by natural obstacles, such as woods, watercourses, etc. The position should be selected with regard to the routes leading to the rear.

1085. A step-by-step opposition to the enemy's pursuit, by taking up and holding successively covering positions to the rear of the main position can not be continued long without involving an excessive number of troops and increasing the demoralization of the entire force. The number of covering positions taken up in the immediate vicinity of the battle field must be reduced to a minimum by organizing the retreat and forming a rear guard as soon as possible after the decision to retreat has been reached.

1086. The commander of the whole, having given orders for withdrawal, should go to the rear, select a rendezvous point, and devote himself to the reorganization of his command.

The rendezvous point is selected with regard to the natural channels of movement approximately straight to the rear. It should be distant from the battle field and should facilitate the gathering and protection of the command.

1087. In small units, a limited withdrawal may sometimes be effectively employed as a means of drawing a pursuing enemy in a direction such that he will come under heavy flanking fire or expose himself to being counterattacked from the flank.

CHAPTER VII.

MINOR WARFARE.

Sec. I.—MINOR OPERATIONS.

1088. Minor warfare embraces both regular and irregular operations.

Regular operations consist of minor actions involving small bodies of trained and organized troops on both sides.

The tactics employed are, in general, those prescribed for the smaller units.

1089. Irregular operations consist of actions against unorganized or partially organized forces, acting in independent or semi-independent bodies. Such bodies have little or only crude training and are under nominal and loose leadership and control. They assemble, roam about, and disperse at will. They endeavor to win by stealth or by force of superior numbers, employing ambuscades, sudden dashes or rushes, and hand-to-hand fighting.

Troops operating against such an enemy usually do so in small units, such as platoons, detachments, or companies, and the tactics employed must be adapted to meet the requirements of the situation. Frequently the enemy's own methods may be employed to advantage.

In general, such operations should not be undertaken hastily; every preparation should be made to strike suddenly and to inflict the maximum punishment.

In general, the service of information will be insufficient; adequate reconnaissance will rarely be practicable. March and bivouac formations must be such as to admit of rapid deployment and fire action in any direction.

1090. In the open country, where surprise is not probable, troops may be marched in column of squads preceded, within sight, by a squad as an advance party.

1091. In close country, where surprise is possible, the troops must be held in close formation. The use of flank patrols becomes difficult. Occasionally, an advance party—never less than a squad—may be sent out. In general, however, such a party accomplishes little, since an enemy intent on surprise will permit it to pass unmolested and will fall upon the main body.

Under such conditions, especially when the road or trail is narrow, the column of twos or files is a convenient formation, the officers placing themselves in the column so as to divide it into nearly equal parts. If rushed from a flank, such a column will be in readiness to face and fire toward either or both flanks, the ranks being back to back; if rushed from the front, the head of the column may be deployed, the rest of the column closing up to support it and to protect its flanks and rear. In any event, the men should be taught to take some form of a closed back-to-back formation.

1092. The column may often be broken into two or more approximately equal detachments separated on the march by distances of 50 to 100 yards. As a rule, the detachments should not consist of less than 25 men each. With this arrangement of the column, it will rarely be possible for an enemy to close simultaneously with all the detachments, one or more being left unengaged and under control to support those engaged or to inflict severe punishment upon the enemy when he is repulsed.

1093. The site for camp or bivouac should be selected with special reference to economical and effective protection against surprise. Double sentinels are posted on the avenues of approach and the troops sleep in readiness for instant action. When practicable, troops should be instructed in advance as to what they are to do in case of attack at night.

1094. Night operations are frequently advisable. With the small forces employed, control is not difficult. Irregular troops rarely provide proper camp protection, and they may frequently be surprised and severely punished by a properly conducted night march and attack.

Sec. II.—STREET FIGHTING—OCCUPATION OF CITIES.

General Statement.

1095. Landing and expeditionary operations in the Naval Service partake largely of the nature of minor warfare. The opposing forces are usually poorly organized, with little or no artillery, and their plan of campaign consists largely in the attack and defense of cities. The loss of a city hurts the prestige of the hostile people and the morale of their troops more than the losses of battle.

In this method of warfare the cities are, according to old-time principles, defended as strongholds, and all available features are utilized as a means of prolonging the defense. Therefore, street, house, and roof fighting by organized and unorganized bodies may be expected in the occupation of any city. Sniping from roof tops, cellars, etc., is used, especially after the organized forces have been dislodged and the victorious troops are spread out in occupying the town.

1096. With a large organized force the enemy will naturally make his primary defensive stands either on some prominent and suitable terrain in the vicinity of the town, or at its outer edge. Attacks on such positions are governed by the principles of modern tactics and need no consideration here. The ultimate line or period of defense will consist in the house-to-house fighting mentioned above and is the subject-matter considered herein. The principles of street fighting herein described, while especially applicable in the above cases, may often be employed with advantage in any hostile country, or on riot duty.

General Principles and Objective.

1097. Success in the primary engagement on the outskirts of the city will be brought about through the usual influences of an enveloping or turning movement. The defenders may be quickly dislodged from their position by such tactics and, in general, will follow one or two courses or a combination of both. They may withdraw beyond the town to some other city and leave the interior defense to the inhabitants, or they may join the inhabitants in the latter action; or, especially in case of a rout, they may divide and follow both lines of action. In any case the victors will find opposition, organized and unorganized, within the city proper.

1098. In addition to resistance by organized troops, and even when this is lacking, resistance may be looked for from the populace; principally, of course, from more adventurous spirits—youths, the tough characters who, besides being easily inflamed by low-class leaders, hope to plunder and loot in the confusion and disorder. The police may be expected to join in the resistance. A certain percentage of the better class of citizens will be found willing to risk their lives and property by sniping at our troops.

1099. It is often the custom to keep arms concealed in dwellings and places of business. In view of this custom, it is necessary, in taking a city, to secure all the arms possible from the inhabitants at the very beginning; otherwise sniping will occur for days after the occupation, and restoration of order will be considerably delayed. A thorough search of every building is requisite. The search should be carried out during the advance or it will have to be done afterwards, spasmodically, at considerable inconvenience, creating friction and lessening the tranquillity and confidence of the populace.

1100. Organized firing ceases following the occupation of a town and the withdrawal and dispersion of the enemy. But isolated groups and individuals, well armed, remain on housetops, in towers, and in concealment. These snipers, without definite cooperation, but upon every favorable opportunity, open an exceedingly dangerous fire, difficult to locate or return. Unless promptly and effectually cleared out, this class causes continued annoyance and many casualties. Delivered with extreme deliberation and in almost perfect safety and concealment, the fire of snipers is peculiarly dangerous to patrols and sentinels, and prompt and vigorous measures are necessary to protect the occupying troops.

1101. Disposition.—To meet such situations, if the strength of the command will permit, two forces having separate and distinct duties must be organized. The size of these forces is dependent on the numbers engaged and the line of action followed by the unsuccessful defenders. The first or covering force is for the purpose of pursuit, observation on the farther edge of town, surrounding the town, etc. This force will gain its proper position with the least loss of men and time by skirting the town, thus avoiding street fighting. There will be many cases where lack of troops or other reasons make it inadvisable to provide a covering force. Whenever such a force is employed, care must be exercised to so use it as not to interfere with, or endanger by its fire, the occupying force. The other force is for the purpose of clearing and occupying the town proper and is the one to be specially considered.

1102. The **covering force** acts according to the special situation presented, and adopts the methods best suited to each case in accordance with recognized tactical principles. The **occupying force** has a duty to perform which calls for the methodical use of the troops in accordance with a prearranged and well-understood system. The system must be prescribed in detail and all men instructed in its essential features. If the system is well understood and strictly adhered to, a saving of life will result, as the work will be done thoroughly and instances of friendly troops firing into each other will be avoided. A definite and rigid system for this class of work has no more relation to normal formations than fixed methods of company deployment have to normal formations for attack. A system once devised may be employed as circumstances demand, since the adoption of a fixed system limits in no manner the method of its employment. With adherence to a definite system by the smaller organizations their part in the teamwork and cooperation will be assured. Without a fixed method these smaller units will be prompted mainly by a desire to be first at the principal points and the work will not be thoroughly done. The objective is, of course, the complete occupation of the town and subjugation of its inhabitants. Depending on the resistance encountered, this involves a slow, deliberate advance coupled with a careful house to house search for arms.

Architecture and General Characteristics.

1103. Cities or towns which from their solid construction are most apt to be used as strongholds, and in which street fighting is likely to be encountered, often have the following characteristics:

1. An approach to a rectangular arrangement of streets.
2. A system of building construction characterized by rather narrow streets, thick masonry or mud building walls set close to the sidewalks and without intervals between buildings, flat roofs usually intercommunicating in the same block and frequently having copings which afford cover from fire, large windows and doors, frequently barred, interior courtyards through which all or nearly all houses in a block may be entered from the rear, and means for reaching roofs by trap doors. Cellars with apertures opening on the street are also found.
3. Several large public buildings, in addition to barracks or forts, from which resistance may be expected.
4. Large churches of massive construction from which resistance is likely.
5. A sprinkling of towers on churches, on public buildings and sometimes on dwelling houses, from which rifle fire and even machine-gun fire may be directed—these towers always command a number of neighboring roofs.
6. One or more public squares about which some of the most important buildings are located and about which resistance is likely to center.

7. In the larger and more up-to-date cities may be found several buildings, such as hotels and office buildings, with some modern improvements, usually under foreign control and occupation, and usually two or three stories higher than other buildings in the city.

8. There may exist some cities of circular shape, but these are the exception—their characteristics as to construction are similar to the foregoing.

9. On the outskirts of the cities are frequently found cemeteries and chapels surrounded by stone walls with defensive value.

Action of Occupying Force.

Preliminary Arrangements.

1104. Reconnaissance.—If plans of the city or town to be occupied are not available, a hasty reconnaissance should precede the issuance of orders for the occupation. This reconnaissance is for the purpose of gaining general direction of the main streets and information as to special localities, such as public squares, barracks, etc., where serious opposition may be expected. If an old map is used, troops should be cautioned to locate the streets assigned them by their positions on the map and not to be misled by a different name on the street corner, as street names are often changed. A great deal of important data may be gathered by the troops during any preliminary engagement on the outskirts of the town. Officers and men should be impressed with the importance of this information and be required to furnish it to the proper officer. In order to insure thoroughness and cooperation, the foregoing information is essential in prescribing the duties of the occupying troops.

1105. The occupying force may be able to carry out its function while the covering force is en route. Except in the case of small villages and unless the time element demands such action, it is often better to utilize the occupying force, during the preliminary stages, in keeping the enemy engaged on the near edge of town and in performing the reconnaissance mentioned above. A friendly force on the farther edge of town, properly handled, will facilitate immensely the work of the occupying force.

1106. Direction of advance.—The selection of a desirable side of the town through which the troops will make their first entrance is not always practicable. The deployment for an attack of a position outside of the town and the resulting practical dispositions of the troops may prohibit the selection of any special side. In any case the following principle must be adhered to as far as practicable:

Select and order a line of advance, whether along streets or through buildings, which will guarantee the movement of all troops in the same direction. This is essential in order to avoid a convergence which might result both in interchange of fire between our troops and in failure to cover some parts of the town. This is a less difficult procedure in rectangular-shaped towns than in the circular or irregular forms. In the latter case the method of following along fixed lines, determined by designated features of the town, such as church steeples, must be carried out, whether the designated lines follow streets or go through buildings and courtyards.

1107. **Orders.**—The orders for the occupation should include the plan of action of the whole command, the general direction of the advance, a division of the town into sections and the assignment of troops to each section, the retention of a reserve, the protection of the flanks, the disposition of prisoners and of the arms found, the use of artillery, and any special features.

1108. **Sections and assignments of troops.**—The division lines of the sections should be in the direction of the advance and not at right angles therein. The sections should be from one side of the town straight through to the other side. This may necessitate long, narrow sections, but it will insure unity of command and avoid confusion. Main streets should not be selected for section lines, as a division of authority at such points is undesirable. If the street can not be definitely described and used for this purpose, conspicuous features of the town coupled with compass directions will answer.

The width of a section to be assigned to any organization is governed not only by the amount of opposition but also by the depth of the section. It must be remembered that the whole occupying force can not move from one edge of the town to the other. As the advance continues, detachments must be left behind to guard that part of the town passed through. The depth is fixed, as the section should run straight through the entire town, and upon this factor depends the width assigned to any organizations. For instance, if the depth of the town in the direction of the advance averages 2 miles, a battalion should not ordinarily be assigned a width of more than two streets, i. e., one block and one-half of the adjacent blocks. In section assignments streets should be inclusive or exclusive. No method of assignment should be used which divides the authority on any particular street.

Each regiment should be assigned a definite section, and in turn should assign certain parts of its section to its battalions. These divisions and subdivisions should follow the principle of having sections which will extend straight through the town. The battalion should be the basic unit of assignment and execution of the work.

1109. Artillery, mounted detachment, and pioneers.—The terrain surrounding the town may afford suitable positions from which artillery and machine-gun fire can be directed over the troops against such places as towers, churches, and other prominent defensive buildings. Intercommunication between the commanders of the occupying troops and the artillery will permit such use of the latter arm. If the occupation is protected by the guns of the fleet, so much the better. A good system of communication is essential.

A mounted force will be best used with the covering force for flank protection and observation on the farther edge of the town. Cavalry should not be used in street fighting if other troops are available; but if used, it fights dismounted.

Pioneers may be valuable in demolition work. If no special function exists for these troops, detachments equipped with explosives should be assigned to each infantry regiment. It will be advisable in many cases to assign to each infantry battalion a detachment of pioneers equipped for escalade. Also in some cases detachments equipped for fire fighting should be attached to the reserve of the occupying force.

1110. Reserves.—The retention of general and local reserves will be governed entirely by the tactical situation. The necessity for flank protection, the possibility of serious encounters in barricaded streets, interior forts, and defensive areas should be considered in this connection. With a covering force on the flanks and on the farther edge of town, little necessity for more than a small reserve will exist.

The Details of Occupation.

Specific Duties, Section Assignments, and Distribution of Troops.

1111. As stated in the foregoing, the battalion should be regarded as the working unit and the basis of sectional assignments. Its duties include:

1. The clearing away of all opposition.
2. Searching for arms.
3. Collection of arms.
4. Providing a temporary guard for the occupied section until relieved by a provost guard.

1112. The division of the battalion for the performance of the foregoing duties is similar to its tactical formation for attack. The strength of its subdivisions is governed by combat principles. The duty of clearing away all opposition and the search for arms is performed by the firing line. The collection of arms, the supply of the guard, and any reinforcing for the firing line is performed by the battalion support.

1113. The units designated for the firing line should be assigned definite subsections and be directed to cooperate in the advance and the duties incident thereto. In the assignment of sections to battalions and of subsections within the battalions streets must not be specified as boundaries between sections or subsections. As a rule the boundaries will be the median line halfway between streets. If a battalion has a single street assigned it, its section will extend to the middle of the block on each side, and there will be no subsections. If it has two or more streets assigned, there will be subsections for each street.

1114. The firing line.—The firing line furnishes no guards. It continues its advance through the town. The senior officer of the firing line commands the same and regulates its advance, which should be simultaneous, block by block. No part of the firing line should advance beyond a block without the above officer's authority.

In performing its duties the firing line may advance along the streets or through the buildings and yards adjoining. Each method has disadvantages; the former presents a more favorable target to the snipers, while the latter permits the men to get out of hand, leads to confusion and incompleteness of the work. Both methods may have to be used, especially in circular or irregular shaped towns. Where practicable, the street system is deemed best.

In dividing the section among the troops of the firing line, a prerequisite is to have an officer in charge of each street. The strength assigned to each street will vary in proportion to the depth and width of the section and the size of the companies. Platoons and even half platoons may be sufficient in some cases. Still the company as a whole should remain under the c. c.'s control and assignments arranged with this in view.

1115. Each force assigned to any street should be organized into a **main body, street detachment, roof detachment,** and a **searching detachment.** The strength of the detachment will depend upon the opposition encountered and the amount of work required by them. Generally one or two squads are sufficient for each detachment.

1116. The street detachment operates along the street and in advance of the **searching detachment.** It clears away all opposition in the street, in windows, doors, and window porches. It advances from one cross street to the rear side of the next and then awaits orders. The advance is made with a column of files on each side of the street, such cover as is afforded by doors and windows being utilized. The men on one side of the street should be charged with responding to any hostile fire delivered from upper windows and roofs on the other side. When the next cross street is reached the detachment does not cross it, but responds from concealed positions to any hostile fire delivered from the adjacent block on the cross street. This action, combined with that of the **roof detachments,** should clear out any opposition on the cross street.

1117. After opposition on the cross street is disposed of and the **roof detachment** of the same organization has reached the tops of the houses at the near side of the cross street, word is sent to the officer commanding the street. After the **searching department** has completed its work, he has a flag or handkerchief raised in the cross street to indicate his readiness for a new advance.

The commander of the firing line, after assuring himself of the readiness of all troops, signals, by his whistle, for the entrance into the next block, which should be made simultaneously by the whole line.

1118. The **roof detachment** should be under charge of an officer or experienced p. o.; it is divided into sections, one for each side of the street. These sections gain the roofs at once and gradually advance, as far as practicable, from roof to roof, until the last roof of the block is reached. From this point the detachment disposes of any opposition located on roofs or in houses on the opposite side of the cross street or down the street it is operating on. The fire of this detachment must be directed to its front. Flank and cross fire would endanger friendly toops. The detachment remains on the roof of the houses on the near side of the cross street until a new roof detachment has gained the roofs of the houses on the far side. When this action is about to be taken the old roof detachment should be so informed. The old roof detachment joins its main body when the new (advance) roof detachment is in place.

1119. The **searching detachment** works in as many groups as practicable, designated as needed by the officer in command of the street. These parties systematically search every building and courtyard and every room in every building of its half of the block. The search must be very thorough and probable hiding places examined. The principal object of this slow and deliberate occupation of the town is to secure all arms during the first stages of the occupancy, and thus prevent sniping and disturbances later on. The importance of this work must be impressed on the men. All arms and ammunition found by the detachment are placed in the street in one pile for each block. As explained later, these are cared for by the support.

After the searching detachment has completed its work in the block and joined the street detachment, the officer in command should have a check made to discover losses. The signal of readiness for the next advance can then be given.

1120. The **main body** of the street force is utilized to reinforce the **street and searching detachments.** This force is held under cover of a cross street until the next cross street is cleared when, by a rapid advance, it gains the cover of that street. New roof detachments are then made for the next advance.

1121. The battalion support.—The battalion support performs the triple function of collecting the arms, reinforcing the firing line, and furnishing the guards.

1122. Special details should be made, under charge of an officer, for the collection of arms. Carts should be impressed and used for this purpose. The arms, piled in each block by the firing line, should be carted to some central place in the battalion section and held for orders from higher authority.

As the firing line clears out the various blocks, guards should be detailed from the support to observe this part of the district and to watch the arms until the collecting detail has taken them away. Guards should immediately inspect areas assigned them to see that no houses have been overlooked by the searching parties, or are occupied by dangerous persons after the passage of the searching parties. In some cases where resistance is particularly bitter, it may be necessary to evict all the inhabitants of some blocks, or even of an entire city; this duty will generally fall on the guards and not on the searching parties. By use of patrols, large areas may be covered.

The support, in one body, should follow the firing line at a suitable distance (two or three blocks). Connecting files for communication are kept on each street. The support may find frequent opportunity for a free advance on one street with the object of flanking the barricades on another. Communication should be maintained by the support with adjacent units and regimental headquarters.

1123. Machine guns.—Machine guns are valuable in this work for flanking fire against barricades and to clear out streets and towers.

Their mobility and inconspicuousness permits their use to advantage from windows and roofs at street corners and from towers.

They can not be allowed to advance or operate independently of the commanders of the firing line. Such action would endanger friendly troops and lead to a lack of coordination. It is better to assign them to battalions and have them operate under the battalion commander's orders at such places and times as he deems best.

1124. **Useful adjuncts.**—The following tools and others which will suggest themselves can often be secured and used to advantage:

Shovels, lanterns, crowbars, heavy sledge hammers, axes, pick-axes, saws, cold chisels, small ladders, tables, rope, railroad ties, rails, and large timbers for battering rams. Occasion may arise for the use of grenades, dynamite, and guncotton.

Sec. III.—RIOT DUTY.

1125. Federal troops will be called on to perform riot duty, only where the disorder is serious and widespread, and the civil authorities and State troops are unable to handle the situation, or in case of national calamity, such as the Galveston flood or the San Francisco fire.

1126. There is a marked distinction in the employment by a military commander of the forces under his command, on his own initiative, for aid in case of great national calamity, such as a flood or a fire, and his employment of military force for the suppression of riot and disorder. In the first instance, troops can immediately be made available if asked for, or if offered and accepted. In the case of riot and disorder, however, they can not be employed, except for the protection of Government property, until ordered out by proper Federal authority, by order of the President of the United States.

1127. In case of wholesale and universal disorder in a town, city, or district, troops when properly ordered out will, in general, be required to carry out the tactics prescribed for the occupation of hostile towns and cities (arts. 1095 to 1124), or at least a modified form of these tactics. No exact rules can be prescribed; each case must be handled separately, and the severity of the measures and precautions taken to obtain the desired result should be so directed as to reestablish law and order in the shortest practicable time, with a minimum of violence and bloodshed.

1128. A mob in the beginning is cowardly. Its individuals hesitate at open violations of the law, and are fearful of its consequences.

Later the individual wills merge into the "mob will," unreasoning, impulsive; leaders spring up, and a spirit of daring and recklessness allays the individual's fear of consequences. When the mob has reached that stage, and especially after it has been successful in carrying out deeds of violence and crime, it becomes difficult to handle. In such cases it is folly to attempt to temporize or argue with them. Only firm measures properly applied with an adequate force will produce the desired results.

1129. In the case of unlawful assemblies to be dispersed, warning must first be given by a civil officer, if one be available, otherwise by the commanding officer of troops. This warning cautions so-called innocent bystanders and curiosity mongers that their presence makes them equally guilty with the rest. They must be given a reasonable opportunity to get away.

1130. The use of blank ammunition should never be permitted. Useless bloodshed will result because eventually ball cartridges will have to be employed. Troops must be kept well in hand and rigid fire discipline enforced. Expert shots are designated to fire when ordered. The shooting down of leaders and individuals who offer armed opposition, or who stone the troops, will produce a salutary effect, and will save the wholesale loss of life, certain to follow, if indiscriminate firing is permitted.

1131. Troops will habitually work in detachments adequate to handle any situation which may confront them. Particular attention must be given to the service of security and information, and in the protection of the flanks. Local reserves will generally be required. Avoid the danger of hand-to-hand clashes and close-in fighting. Here the mob, because of its superior numbers, has all of the advantage. The troops could, and probably would, be easily overpowered and disarmed. Keep the mob at such distance that the troops can employ their weapons, and use their training and discipline to the best advantage. The men must be made to understand that in dealing with citizens they must be most courteous, yet firm in carrying out their instructions; that they pay no attention whatever, nor appear to hear, insults or epithets from the crowd.

1132. If the disorder is confined to a particular locality or district, this section must be segregated. All gatherings must be immediately broken up, and individuals on the streets be required to keep moving. The streets must be constantly covered by patrols, and supports established at proper points. Special guards will be established at plants or buildings which may become the object of the mob's activities. All bars and disorderly houses should be closed, and hardware stores containing firearms and ammunition must be closed and guarded.

Particular attention must be paid to the lighting system, telephone system, and water supply. Their sources and connections must be carefully guarded against interruption or destruction.

Fires must be particularly guarded against.

No person will be permitted to pass in or out of the disaffected district without proper authority.

1133. An intelligence service will be established, and qualified civilians, or officers and petty officers, in civilian clothes, must be freely employed for obtaining all needed information. Activities in other parts of the city must be carefully watched and care must be taken to prevent such disorders, or meetings anywhere, as may tend to riot and disorder.

1134. Press censorship may be required. Papers published or controlled by any of the disaffected parties will, in general, have to be censored. Parties responsible for a violation of the censorship will be punished, and a repetition of the offense by the paper concerned should result in its publication being suppressed during the period of the existing emergency.

It may here be stated and emphasized that where the disorders and riots are due to trouble between opposing factions (as in labor disputes), the attitude of the military authorities should be one of strict impartiality. The object of the military authorities is to reestablish law and good order and not to become partisans of any faction or organization, and this purpose should be clearly impressed on all concerned.

1135. If the disorder be great and sniping against our men has occurred, all houses and persons in the disaffected district must be systematically searched for arms. In any event, all armed individuals of all factions must be disarmed. At night it may be necessary to enforce a curfew law, requiring all persons to be off the streets from an hour designated by the military commander. It may also be necessary to require all blinds and shades to be left open, and for all front rooms to be kept lighted during the night.

FLOOD, FIRE, AND NATIONAL DISASTER.

1136. The employment of the military forces in such cases as fire, flood, and national disaster will be somewhat different from the duties heretofore prescribed. The troops can safely be employed in small detachments, or as individual sentinels. Looters and ghouls should be summarily dealt with. Working parties to succor the wounded and bury the dead will be organized. Provision will be made to care for and feed the homeless and destitute. Transportation will be requisitioned, and if necessary seized. Citizens can be helpfully employed for relief work. Civilian laborers working in the ruins, or in other similar work, should be provided with distinguishing marks or brassards, and have written authority from the proper source, to avoid unnecessary interruption and to provide identification while so engaged.

For use of explosives to prevent the spread of fire and for the destruction of dangerous ruins, see Demolitions, Art. **1197** et seq.

CHAPTER VIII.

FIELD ENGINEERING.

Sec. I.—FIELD FORTIFICATIONS.

Definitions.

1137. **Abattis.**—An obstacle consisting of felled trees, often interlaced with wire. The trees are felled or placed with their tops toward the enemy.

Banquette.—The place upon which men stand to fire over a parapet. Usually called the **firing step**.

Berm.—A small place left between the parapet and excavations of a work.

Chevaux-de-frise.—An obstacle in the form of a saw horse with several legs.

Command.—The vertical height of the crest of a work above the natural surface of the ground or above the crest of another work.

Counterscarp.—The side of the ditch of a work farthest from the parapet.

Cover.—Protection from fire and view.

Crest.—The intersection of the interior and superior slopes of a parapet.

Ditch.—An excavation which is not intended for occupation. It serves as a source of supply of earth for the parapet, an obstacle to assault, or a means of drainage.

Enfilade.—Fire from the flank, parallel or nearly parallel to the line against which it is directed. It is particularly effective and demoralizing and is always carefully guarded against.

Exterior slope.—The outside slope of a parapet extending downward from the superior slope.

Fascine.—A long cylindrical bundle of brush used as a revetment.

Flanks.—The extremities of a defensive line and the ground in their vicinity.

Fortification.—Any engineering work or accessory device which increases the fighting power of troops by affording shelter or concealment or increases fire effect, or which restricts the tactical maneuvers or fire effect of the enemy.

Fortification, field or hasty.—Those works executed by combatant troops in the field to meet immediate tactical needs.

Fougasse.—A small land mine with a charge of explosives and broken stone. It is fired by powder fuse or electricity as the enemy approaches.

Gabion.—A hollow cylinder of brush or other material which is filled with earth and used as a revetment.

Head cover.—A vertical shield of any material which protects the heads of the troops from fire.

Hurdle.—A revetment of woven brush.

Interior slope.—The inner slope of a parapet extending from the crest to the banquette.

Listening posts.—Sheltered positions in advance of a defensive line for the purpose of early detection of the enemy's movements. They are connected with the main line by a communicating trench or subterranean gallery.

Loopholes.—Openings in a parapet or head cover through which fire is delivered.

Observation posts.—(See also listening posts.) Observation posts may also occupy commanding positions in rear of the firing line.

Obstacle.—Any device which retards the enemy's movements without affording him shelter from fire.

Overhead cover.—A horizontal or inclined shield of any material which extends over the heads of the troops and protects them from high angle fire.

Parados.—A bank of earth in rear of a trench to protect the occupants from the back draft of shells bursting behind the trench

Parapet.—A bank of earth or other material in front of a trench or emplacement, which protects the occupants from fire.

Relief.—The vertical height of the crest of a work above the bottom of the ditch.

Revetment.—Any device used to hold earth or other material at a slope steeper than the natural slope.

Scarp.—The side of the ditch nearest the parapet. Also called **escarpe.**

Splinter proof.—A shelter similar to a bombproof, but designed to afford protection only against rifle bullets, shrapnel, and shell fragments. It is not proof against penetration by large projectiles.

Superior slope.—The top of a parapet immediately forward from the crest.

Traverse.—A bank of earth or other material in rear of and perpendicular to the parapet for the purpose of protecting the occupants from oblique or enfilade fire and to localize the effect of shells bursting in the trench.

Trenches.—An excavation which is for use either as a means of concealment, protection, or both. According to their use they are classified as **fire, support,** and **communicating** trenches.

Wire entanglements.—An obstacle of wire or barbed wire strung on posts or other supports; the most commonly employed obstacle.

General Principles.[1]

1138. The purpose of field fortifications is to increase the power of resistance of the troops occupying them by decreasing their exposure to the fire of the enemy and increasing the accuracy and volume of their own fire. They thus serve to hold the enemy in check and limit his power of maneuver. Furthermore, they accomplish this result with the least number of men, thereby rendering the greatest possible number available for aggressive concentration of superior forces at the critical points.

1139. Even in a successful attack the assailant can not advance continuously. Halts will be necessary to permit of the bringing up of supplies and reenforcements, to refresh the troops, to hold the enemy in check, to select new points of attack, to readjust the artillery positions, etc. The assailant at all such halts must cling with the spade to that which he has won with the rifle or bayonet. Troops can not remain stationary upon the field of battle exposed to the fire of the modern rifle, machine gun, and artillery.

1140. Fortifications, therefore, while **essentially defensive** in their nature, will be extensively **employed also in the attack.** The neglect to utilize them will involve heavy losses and, if opposed to a skillful adversary, will invite defeat. On the other hand, **their excessive and indiscriminate use** limits the mobility of the troops, tends to destroy the aggressive spirit which is essential to success, and surrenders the initiative to the enemy.

1141. The technical details of the works themselves are comparatively simple and readily comprehended, but their location, arrangement, and adaptation to the tactical situation and to the terrain call for a high degree of skill.

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[1] For detailed discussion of trench fighting and bombing, which are beyond the scope of this work, see standard works on those subjects.

1142. In the early phases of the development of a defensive position, the first concern of the commander is to secure the key points on the line to be defended, the possession of which must be denied the enemy. The defensive line therefore, at first, is made up of a number of defensively organized areas, so located with respect to each other as to be able to support each other by cross-fire of small arms, and which, taken all together, form a line athwart the probable line of advance of the enemy.

1143. These defensively organized areas are called **supporting points.** The garrison of a supporting point is preferably a tactical unit, and the supporting point is constructed ordinarily by the unit that is to occupy it.

In favorable terrain the interval between supporting points may be as great as 800 or 1,000 yards.

1144. In considering the details of the organization of supporting points it is necessary to consider the work that can be carried out in the first three or four hours after the decision to intrench has been reached. Subsequent elaboration of the work depends upon developments in the tactical situation.

The necessary construction work involved will include the following:

1. Fire trenches.
2. Trenches in rear for the supports.
3. Communicating trenches between the support and fire trenches and between adjacent fire trenches.
4. Work on the foreground and clearing the field of fire.

All of this work should go on simultaneously. If this is not practicable, the work should be completed as indicated below.

1. Clearing foreground to improve the field of fire and construction of fire trench.
2. Head or overhead cover; concealment.
3. Placing obstacles and recording ranges.
4. Cover trenches for supports and local reserves.
5. Communicating trenches.
6. Widening and deepening of trenches; interior conveniences.

Construction of Field Works.

1145. Infantry must be capable of organizing its own positions and of executing the field works necessary for their defense. The elementary requirements demand proficiency in respect to the following:

(*a*) Proper siting of intrenchments (**tracing of works**).

(*b*) Construction of fire trenches and communicating trenches (**standard profiles**).

(*c*) Employment of troops in the **execution of field works.**

(*d*) Construction of **trench accessories.**

(*e*) Rapid construction of **wire entanglements.**

(*f*) **Camouflage.**

1146. The location, extent, profile, garrison, etc., of field works are matters to be decided by infantry commanders. Officers must be able to choose ground and intrench it properly. Engineer troops may be assigned to advise and assist in laying out and preparing the position, but infantry commanders are not thereby relieved from responsibility for the action taken in the organization of the position.

Trace.

1147. The term trace usually designates the horizontal projection on the ground of the firing crest. The firing crest should be as nearly horizontal as practicable and should therefore generally follow the contour of the ground. Considerations of drainage will, however, require a slight departure from the contour (see par. 1153).

The protection acquired by digging a trench should be increased by choosing a trace that will avoid enfilade fire and by means of traverses. Traverses serve as protection against enfilade fire and limit the radius of action of shells bursting in the trench. The extent to which traverses are required depends upon the character of the trace (Figs. 21–24) and the extent to which the trench is subject to enfilade fire.

Profiles.

1148. The character of the profile of a trench depends to a great extent on the probable permanency of the projected work. Trenches which are to be utilized for a considerable period should have a profile corresponding as nearly as practicable to the natural slope of the ground in order to reduce the amount of revetment required and avoid the caving in of the sides of the trench. In the construction of hasty cover, on the other hand, the object should be to obtain the most complete protection in the shortest possible time, and the slopes of the trench should be made as steep as the earth will stand and the width of the trench reduced to a minimum (Fig. 29.)

STANDARD TRACES.

Full lines indicate trace for Type B Trench
Dotted " " " " " A "

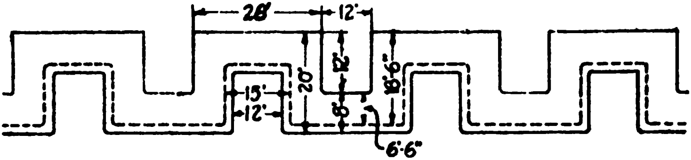


FIG. 21.—Traverse trace.

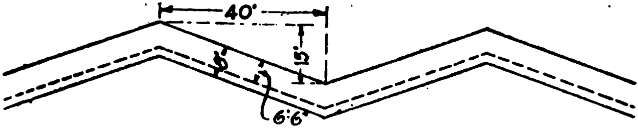


FIG. 22.—Zig-zag trace.

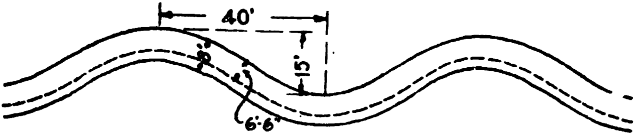


FIG. 23.—Wavy trace.

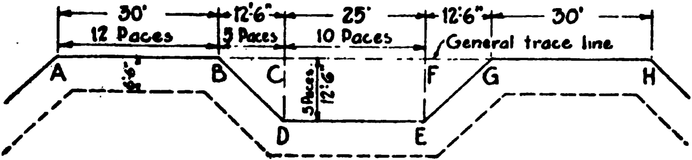


FIG. 24.—Octagonal trace. (Method of tracing indicated.)

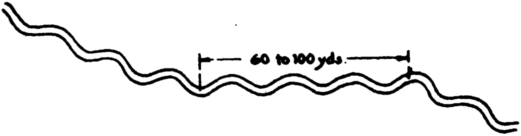


FIG. 25.—Wavy trace (right), with both local and general irregularities.

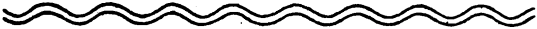


FIG. 26.—Wavy trace (wrong) ; no general irregularities.

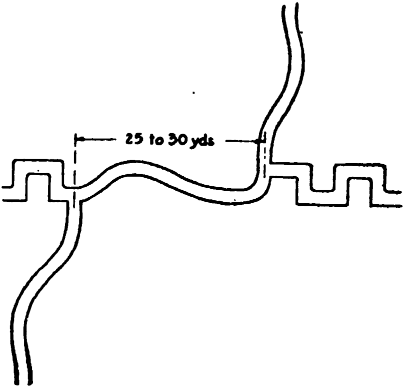


FIG. 27.—Approach crossing parallel.

In permanent or semi-permanent works, standard profiles are necessary in order to permit of the constructon at the rear of standard revetting matériel (e. g., A frames, par. 1168).

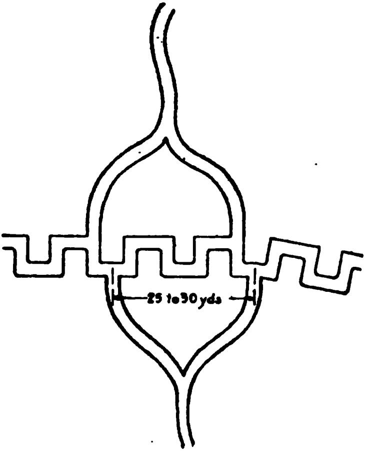


FIG. 28.—Alternative method.

The development of hasty cover into a trench of standard profile is shown in figure 32.

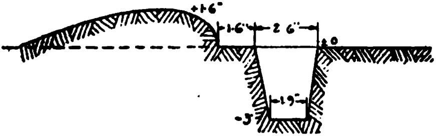


FIG. 29.

1149. The standard profiles for fire and communicating trenches shown in figures 30–36 are based upon the following principles:

(*a*) The elevation of 4 feet 6 inches between the interior crest and the banquette affords a good firing position for a man of average height.

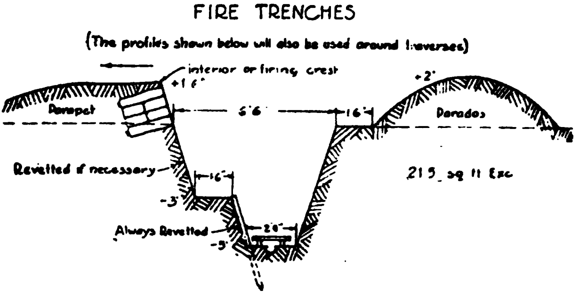


FIG. 30.—Type A. (For use without "A" frames.)

(*b*) During its construction the trench may naturally be used to a greater or lesser extent, depending on the degree of completion. An excavation of 2 feet 6 inches, together with the parapet, gives a total cover of 3 feet, which is suitable for firing from a kneeling position. This, however, is only one phase of the construction; except during a momentary halt, the final aim is always to make the trench suitable for firing from a standing position.

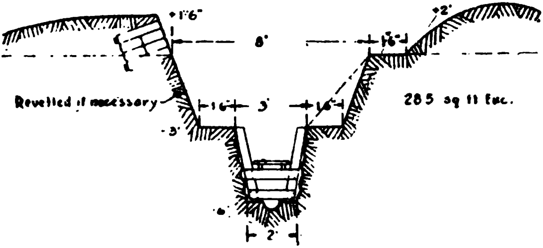


FIG. 31.—Type B. (For use with "A" frames.)

(*c*) The distance of 6 feet 6 inches between the interior crest and the bottom of the trench permits natural walking without being seen.

(*d*) The width of the trench at the bottom (2 feet) permits convenient circulation behind men on the banquette.

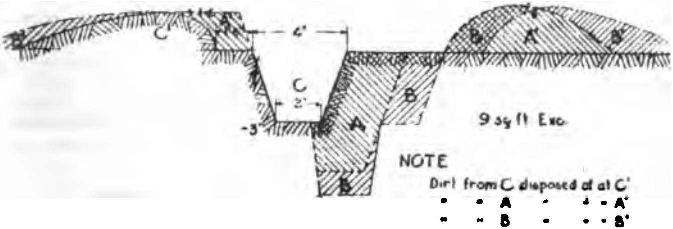


FIG. 32.—Simple standing trench. (Showing development into standard fire trench, Types A and B.)

(*e*) The dimensions of the communication trench—7 feet of total cover—permit convenient circulation with good protection.

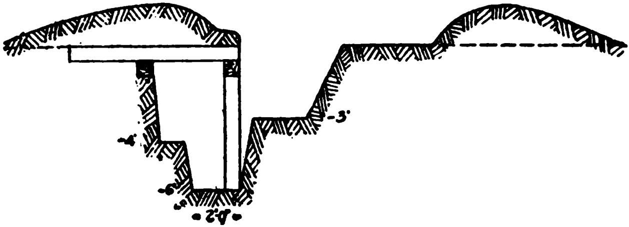


FIG. 33.—Standing trench with splinter-proof.

(*f*) Berms are indispensable for preventing the sides from caving in under the pressure of the excavated material; a width of 1 foot 6 inches is the minimum.

The standard profiles will often be modified, particularly with reference to the following:

COMMUNICATION TRENCHES.

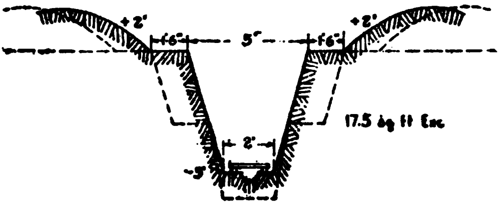


FIG. 34.—Type A. (For use without "A" frames.) (Also shows development to Type B.)

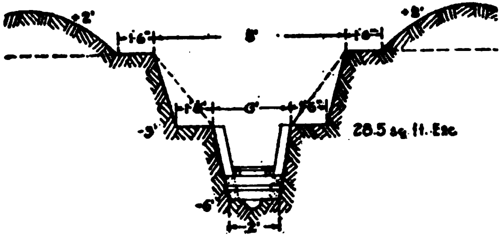


FIG. 35.—Type B. (For use with "A" frames.)

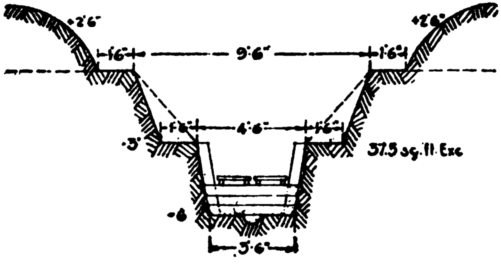


FIG. 36.—Type C. (Broad communication trench.)

Decreasing the width, thereby reducing the amount of excavation and increasing the protection for temporary or hastily constructed works;

Increasing the relief of the parapet so as to have a better view from the trench;

Decreasing the depth of the excavation (and consequently increasing the relief of the parapet) necessitated by the presence of water or rock near the surface;

Decreasing the width in very hard soil, which permits the trench to have steep sides;

Removing the excavated material from the edge of the excavation (trench without parapet, deep communication trench) or the use of an underground communication trench (Russian sap), where it is especially desirable to avoid being seen;

Need of protecting certain parts of the communications from hostile view and fire (covered communication trench);

Using natural cover (ditches, slopes, shell holes, etc.);

Increasing the width of the evacuating ("out") approaches and decreasing the width and depth of the secondary approaches.

Sec. II.—EXECUTION OF FIELD WORKS.

1150. The execution of a field work comprises:

(*a*) Reconnaissance of the position; (*b*) tracing on the ground of the lines which determine the horizontal limits of cutting and embankment, or establishment of trace by other method (e. g., stakes, compass bearings, par. 1161); (*c*) placing reliefs on the work; (*d*) actual construction of the trenches.

1151. The construction of a field work should be preceded by a reconnaissance varying in extent with time available and the tactical situation. The objects of the reconnaissance are: (*a*) to determine the field of fire which must be covered and the flankings; (*b*) to determine the natural strong points of the position and the points of especial weakness; (*c*) to fix the general location of the lines with reference to the field of fire and the flankings and the requirements of drainage; (*d*) to compute the labor, tools, and material required for the construction of the position. When practicable, a sketch should be prepared on the ground showing the general location of the different lines, the observing stations and command posts, and other special works.

1152. According to the situation, entrenchments are constructed either by working along the line or by working from the ends. The former method will generally be employed when not actually under fire. When exposed to hostile fire, the men dig in on the trace of the work so as to obtain cover in the most rapid manner possible and then work toward each other from the ends. Working from the ends is also resorted to in pushing out saps from an existing trench and in joining up sap heads so as to establish a new advanced parallel.

Working Along the Line.

1153. The trace is actually established with reference to the required field of fire by placing the eye at the level of the interior crest.

A tracing party for a field work to be held by a company should consist of an officer, a p. o., and three or four men, equipped if practicable with white tape, stakes, and mallets. The tape is used to locate on the ground the intersection of the cut and elbow rest. As a general rule, only the firing bays are staked out at the preliminary tracing, intervals for traverses being left between successive bays. In leaving space for traverses, a minimum thickness of 3 yards should be allowed. Where tape is not available, the trace may be marked with stones or stakes or by digging a small channel with a pick.

When practicable, both cutting edges of the trench should be traced.

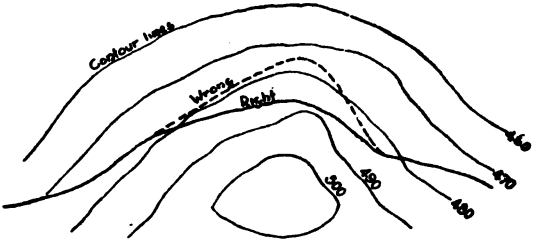
When practicable, care should be taken to site trenches so that all parts can be easily drained toward natural points in the line, avoiding any unnecessary sag which will be difficult to drain later. Trenches should never run exactly along a contour line, but should be given enough slope to carry the water in a prearranged direction. Trenches should not be located in marshy or boggy ground, unless it is absolutely unavoidable. Communication trenches should not be located in the bottom of valleys or gullies but should run along the side slope above the bottom. (Fig. 37.)

1154. After the tracing has been completed, the work is divided into tasks by means of marks made on the ground with a pick. The length of tasks depends upon the method of grouping the working details. In easy soil, the proportion should be 1 pick to 2 shovels, and the working groups should be composed of three men each. In harder soil, an equal proportion of picks and shovels should be allotted, and a working group will consist of two men.

Working groups of three men should be allotted about 15 feet of front, groups of 2 men about 10 feet.

1155. The unit assigned to the construction of the work should, as far as practicable, be divided into reliefs on the basis of tactical organization. A company should, for example, be divided into two reliefs of two platoons each, or three reliefs of one platoon each reinforced by units of the fourth platoon. The amount of work to be done by each relief should be plainly indicated; officers and p. o.'s are responsible that the men do the quantity of work assigned them. As soon as any unit (squad, platoon, company, etc.) has finished its task, it should be relieved.

1156. Tasks should be allotted in terms of volume of excavation. In the allotment of tasks, the following data may be taken as an approximate basis: The capacity of the average man for continuous digging does not exceed 80 cubic feet for easy soil, 60 cubic feet for medium soil, 40 cubic feet for hard soil. He will do three-eighths of this the first hour, five-eighths in the first two hours, and the other three-eighths in another two hours. When contact with the enemy is probable, tasks should be assigned which can be reasonably expected to be completed in a period of two hours in order to conserve the fighting capacity of the troops. For the first relief, the soil is apt to be loose and the lift is less, so that a slightly greater task should be given to it than to succeeding reliefs. Assuming men at 5-foot intervals, the number of hours' work required to dig a trench is the section of the trench in square feet divided by 5 for easy, 4 for medium, and 2½ for hard soil.



Siting trenches to eliminate low spots

FIG. 37.

1157. In the construction of trenches, arrangements for drainage should, when practicable, be made from the beginning. A drainage ditch or sump should be started before the digging of the trench commences, and the progress of its excavation maintained in advance of the trenches draining into it. The excavation of the trenches should be directed up-grade, when practicable, so as to avoid the formation of undrained pockets in the bottom of a partially completed trench. Gutters for intercepting surface water and conducting it to the natural watercourses should be provided on the up-hill side of the trenches (Figs. 38–40).

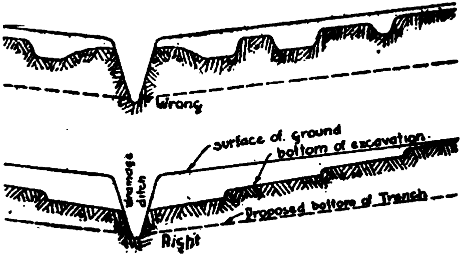
1158. To place a relief on the work, the units constituting the relief approach the tools in column of files, rifles slung, and pass between the pile of tools, shovels on the right, picks on the left. Each man receives a tool as he passes.

The column proceeds to a flank of the trace of the work and forms line parallel to and about three paces in rear of the rear cutting line, men at about 5 feet interval. This interval is most conveniently established by having men extend arms horizontally and touch hands. Each platoon is assigned a particular part of the line and goes to it and deploys independently. If the line is long, guides should be furnished to direct the head of each column to the point where its deployment is to begin. At night, guides must always be furnished.

1159. As soon as the men are posted, the pick men start tracing the limits of their tasks (unless already marked), digging a small furrow along the white tape and then marking the lateral and rear limits. The men then strip the sod or spade off a slight thickness of earth from the width of the excavation. The sod may be used to form a mask or small parapet or laid aside for subsequent use in revetment or for sodding the parapet when completed. If it is necessary to provide cover rapidly, the men at once dig in depth so as to get some cover as quickly as possible. As a general rule, the excavation should be begun with a width slightly less than that desired. When completed, the walls are dressed up to the desired width.

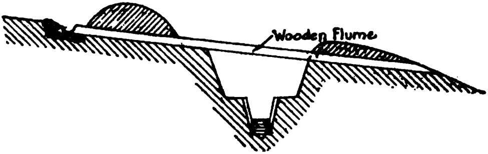
When work is done at night in the presence of the enemy, men must keep absolute silence, lie down immediately on the ground when a rocket goes up, and resume their work when the light has disappeared.

Separate working groups should be assigned to the construction of the trenches around traverses. Unless labor is abundant, their construction should generally be deferred until the fire bays are completed.



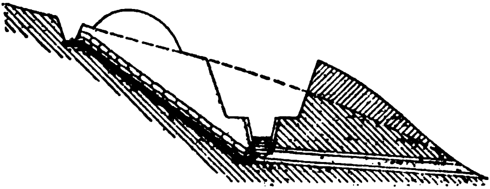
Longitudinal section of Trench under construction.
(Showing manner of excavating Trenches so as to insure proper drainage)

FIG. 38.



Surface water carried over the Trench.

FIG. 39.



Surface water carried under the Trench.

FIG. 40.

Working from the Ends.

1160. Working from the ends is a slow operation, but it permits working at points and at times when working along the line is impossible. The construction may be accelerated by (*c*) doubling the working parties (shifts working at high pressure and relieving each other at frequent intervals, e. g., every yard of trench); (*b*) by working in two stages (i. e., one group digging to a certain depth, followed by a second group excavating to full depth).

In zones swept by hostile fire, working along the line and working from the ends are employed alternately. The following examples illustrate the application of this method of work:

(*a*) We hold the front *A–B* and wish to establish ourselves at *C–D* (Fig. 41). It is assumed in this case that working along the line is impossible during the day but may be carried out at night, and that working from the ends is possible during the day.

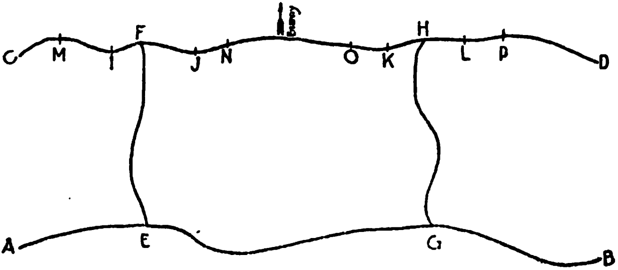


FIG. 41.

The work may be executed as follows:

First night. Constructing, by working along the line, the approach trenches *E–F* and *G–H*, and the elements *I–J* and *K–L* of the parallel.

First day. Continuing the work of the first night by constructing the elements *M–I*, *J–N*, *O–K*, *L–P* (working from the ends, 4 shifts).

Second night. Constructing the element *N–O* (working along the line).

Second day. Continuing the work of the second night.

(*b*) As another example, we desire to construct an element of a parallel or of an approach trench *A–B* (Fig. 42) on ground where working along the line is too dangerous, even at night.

The procedure is then as follows: Instead of beginning work on the entire length *A–B* at the same time, we begin with small groups, such as squads, separated and working at 1, 2, 3, and 4. These groups dig themselves in as rapidly as possible by working along the line. Once they have a sufficient cover, each group separates into two parts which work at both ends of the excavation (working from the ends) under the cover already dug.

1161. When working from the ends in one stage, the method of work is, in general, as follows:

Each working party consists of one p. o., leader of the party, and 4 workmen grouped into two shifts which relieve each other every yard. For continuous work, night and day, the working party should comprise one 1st p. o., 1 subordinate leader, and 12 men, thus providing three reliefs of 8 hours each.

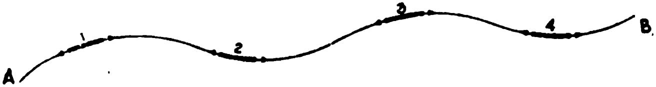


FIG. 42.

In each shift, No. 1 is the digger and No. 2 the shoveler; at each shift, they change their posts, No. 2 becoming No. 1, and vice versa. No. 1 is supplied with a short-handled pick mattock, a short-handled shovel, and measuring sticks for testing work. No. 2 is supplied with an ordinary shovel. The working party is, in addition, provided with 1 extra pick, 1 extra shovel, and 5 stakes.

The p. o. in charge of the party sees to it that the trace is followed and that the dimensions are correct.

When beginning work, each shift marks with a stake the spot at which it is to begin.

If the excavation has not been marked out beforehand, the 1st p. o. marks out the center line of the element to be constructed by means of stakes set at the bottom of the trench (fig. 43).

No. 1 (digger) works at the head of the excavation. He digs it to the final width and depth. First, from a squatting or kneeling position, he digs two grooves to the depth of the pick blade half-way up the excavation, keeping in line with the two walls and preserving the banquette, if it is to be a fire trench; he then digs away the earth between the two grooves with the pick; he passes the earth between his legs by means of the short-handled shovel and scrapes the bottom so as to keep the trench at the correct depth. He then digs the upper part of the trench by marking two grooves, right and left, up to the surface of the ground, digs away the earth thus undermined with his pick and passes it to the rear as described above.

He thus advances by elements of 1 to 1½ feet, and at intervals, verifies the dimensions by means of the notched stick.

No. 2 (shoveler) throws the earth on both sides and is careful to leave the berms.

Nos. 1 and 2 may exchange posts at the middle of the task.

When in danger of enfilade fire, it is necessary to protect the head of the work by a head parapet of sandbags, gabions, or metal shields. These are placed about 1½ feet in front of the head of the work by Nos. 1 and 2 and are pushed forward by hand or with the tools as the work progresses.

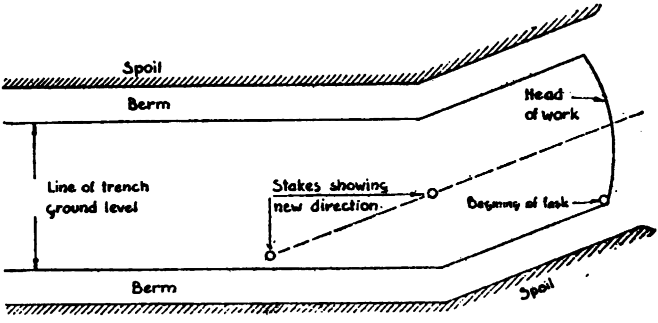


FIG. 43.

As soon as one shift has finished its task of 1 yard, the p. o. in charge of the work orders, "**Change,**" and the shift lays down its tools and is replaced by the second shift.

Working from the ends in two stages is executed in accordance with the following method (fig. 44):

Each party consists of a petty officer in charge of the work and 8 men, divided into two shifts which relieve each other every yard.

When the work is to be continued day and night, the working party should comprise one 1st p. o., one additional leader, and 24 men, thus providing three reliefs of 8 hours each.

In each shift, the men are numbered from 1 to 4; Nos. 1 and 3 are diggers, and Nos. 2 and 4 shovelers; at each shift, Nos. 1 and 2 change posts with Nos. 3 and 4.

Nos. 1 and 2 work at the head; they dig the first stage 3 feet deep. They have the same tools as Nos. 1 and 2 in the case of working in one stage. No. 1 is, in addition, supplied with a measuring stick.

Nos. 3 and 4 work 3 yards behind the head of the work; they deepen the first stage to the correct depth and widen it. They distribute the excavated material on both sides, being careful to leave berms of the correct width (1 foot 6 inches). No. 3 is equipped with a pick mattock and a measuring stick; No. 4 with a shovel. Each working party is, in addition, supplied with 1 extra pick mattock, 1 extra shovel, and 5 stakes.

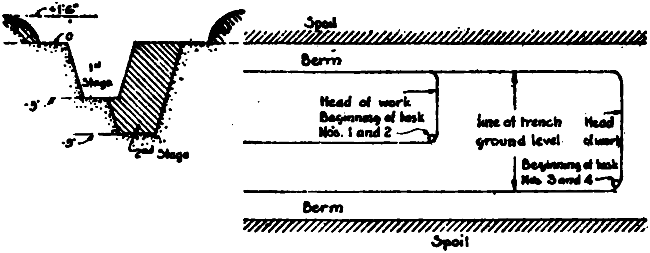


FIG. 44.

Sec. III.—ACCESSORIES OF TRENCHES.

Revetment.

1162. Revetment comprises any artificial means provided to cause earth to stand at a slope steeper than it would naturally assume.

It is used in the construction of parapets, trenches, and other field works. Its too extensive application is objectionable on account of the great amount of time, labor, and material required, and can often be avoided by widening and sloping to a safe angle the sides of existing trenches as well as by the provision of berms or shelves at various levels (see figs. 30–36 for trench profiles requiring little revetting).

1163. The main principle in revetting trenches is to revet only the lower 2 or 3 feet. This portion of trench is seldom injured by the enemy's fire, while higher revetting requires more time, labor, and material, and will almost certainly block the trench if damaged by shell fire. High revetment should be limited to the repair of damage to the trench.

1164. The best method of revetting trenches is:

(*a*) Use standard *A* frames, spaced 3 feet center to center and supporting sheets of corrugated iron, expanded metal, planks, or brushwood (fig. 45).

(*b*) If *A* frames are not available and the soil permits, the revetment may be supported by means of pickets driven into the bottom of the trench and braced as shown in figure 50.

(*c*) The sides of the trench above the revetment should be cut to a slope of about 3/1, leaving a berm of 18 inches on each side at the foot of the unrevetted slopes.

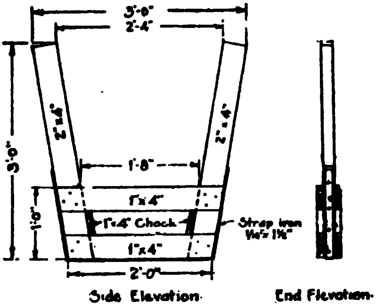


FIG. 45.—Standard "A" frame, spaced 3 feet center to center.

The order in which the revetment of trenches should be undertaken is as follows (figs. 30, 31, 35):

(*a*) Revet the **fire step** and the interior slope of the **parapet** in fire trenches.

(*b*) Revet the lower 2 or 3 feet in communication trenches.

(*c*) Revet the lower 2 or 3 feet of fire trenches above the fire step, if necessary.

1165. There are two general types of revetments:

(*a*) The **retaining wall** type, which is self-supporting and is best suited to **fills**.

(*b*) The **superficial** type, which must have independent supports and is best suited to **cuts**.

Retaining Wall Type.

1166. As revetments of this type must be self-supporting, they should always take the form of a properly built retaining wall, i. e., the thickness at any level should be at least one-half the remaining height and the average thickness not less than one-third of the total height.

1167. Sandbag revetment is easily and quickly constructed, gives no splinters from shelling, and is especially useful for emergency work, for repairs, and for crowning. In laying sandbags attention should be paid to the following points, some of which are illustrated in figures 46 and 47.

(*a*) Tuck in bottom corners of bags before filling.
(*b*) Fill bags uniformly about three-quarters full.
(*c*) Build revetment at slope 41.

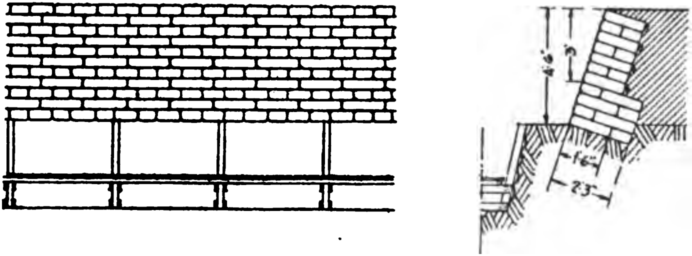
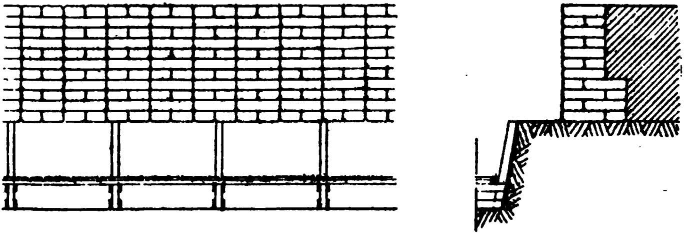


FIG. 46.—Sandbag revetment. Correct method.

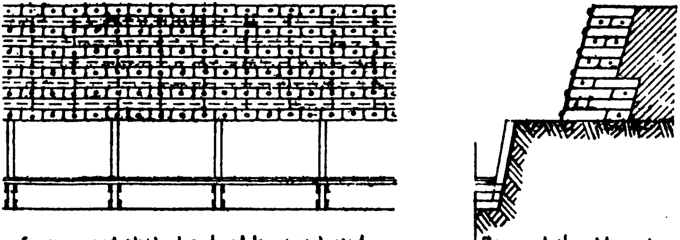
(*d*) Lay bags with beds perpendicular to slope.
(*e*) Lay bottom row as headers on prepared bed, intermediate rows alternating headers and stretchers, top row headers.
(*f*) Lay bags with seams and choked ends inward.
(*g*) Break joints and beat bags into a rectangular shape.
(*h*) A sandbag revetment will last much longer if netting, preferably doubled, is placed over the face, as shown in figure 48.

1167a. Sod revetment is more durable than sandbag revetment, and where sod can be obtained in sufficient quantity its use is recommended. Sods are cut 18 inches by 9 inches by 4½ inches, laid grass down, except the top layer, and pinned together with wooden pegs. The principles *c*, *d*, *e*, and *g* of paragraph 1167, for sandbag revetment, apply equally to sod revetment.



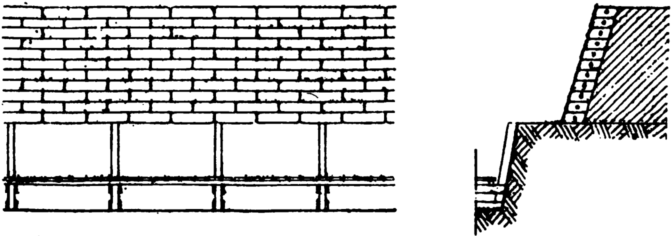
Joints not broken

Face Vertical



Seams and choked ends of bags outward

Bags not at right angle to slope



All stretchers and no headers and insufficient base width.

FIG. 47.—Sandbag revetment. Incorrect method.

Superficial Type.

1168. This form of revetment consists of two parts: The **revetting material**, which retains the earth, and the **supports**, which hold the revetting material in place. It is most useful in retaining the slopes of trenches, since practically no additional excavation is needed to afford space for the revetment itself.

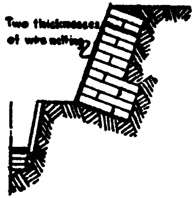


FIG. 48—Sandbag revetment. Reinforced.

The **revetting material** may consist of corrugated iron, planks, expanded metal, brushwood, wire netting, poles, or other available material.

The **supports** may be:

(*a*) **Standard A frames**, for use in the bottom third of the trench as described in paragraph 1164. Methods of placing these frames around corners in traversed trenches are shown in figure 49.

(*b*) **Anchored revetting pickets**, for use in revetting front slopes of fire trenches or in other special cases where high revetment is required.

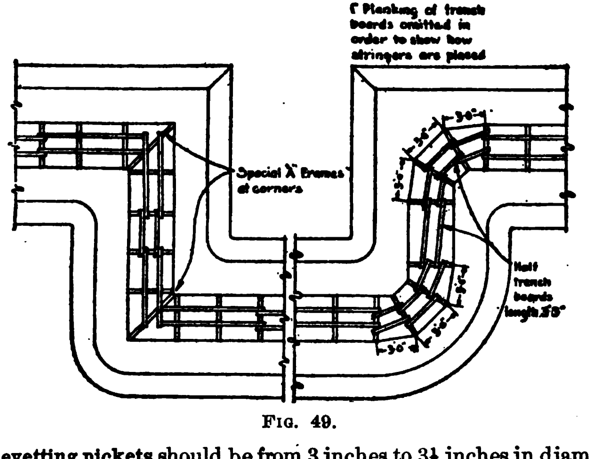

Planking of trench boards omitted in order to show how stringers are placed
Special "A" frames at corners
3'-0"
3'-0"
3'-0"
3'-0"
3'-0"
3'-0"
Half trench boards length 3'3"

FIG. 49.

Revetting pickets should be from 3 inches to 3½ inches in diameter, straight, pointed at the small end, and driven into the ground from 1 to 1½ feet.

Anchor stakes should be driven firmly into solid ground 8 to 10 feet from the edge of the trench, staggered so as to avoid a plane of weakness parallel to the trench, and inclined so as to be perpendicular to the direction of pull on the anchorage wire.

Anchorage wires should pass at least four or five times between picket and stake. Each time take a round turn around the top of picket or stake and then tighten with a rack stick or windlass.

(*c*) **Unanchored revetting pickets** for use only with low revetments such as fire steps. They are supported by being driven from 2 to 2½ feet into the ground and must always be braced at the ground level, as shown in figure 50.

(*d*) **Struts** resting against opposite walls of the trench for use only in narrow deep trenches, such as shell slits (fig. 51).

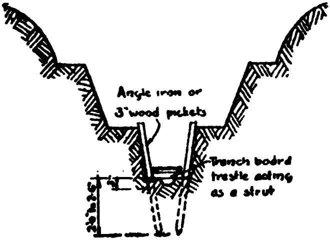

Angle iron or 3" wood pickets
Trench board trestle acting as a strut
2'0" to 2'6"

FIG. 50.—Braced revetting pickets.

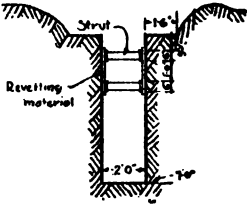


FIG. 51.—Shell slit.

1168a. In placing wire-netting revetment, the following procedure should be observed:

(*a*) Cut vertical grooves in the slope at about 3-foot intervals to hold revetting pickets.

(*b*) Drive the two end pickets of each bay first and anchor them back loosely.

(*c*) Stretch a double thickness of wire netting taut between the two end pickets.

(*d*) Tighten anchor wires so that the end pickets set back into their grooves.

(*e*) Drive the remaining pickets and anchor them back so that they set into the grooves, thus drawing the wire netting tight against the surface to be revetted.

1169. In placing **brush revetment**, the following rules should be observed:

(*a*) Brush should be clear of leaves and is best about ¾ inch in diameter.

(*b*) Pickets should be driven in at about 3-foot intervals, leaving from 4 to 6 inches behind them for the brush.

(*c*) When brush has been built up to the top, pickets should be firmly anchored back, drawing the brush close against the slope to be revetted.

Lookout Posts.

1169a. When located in a trench, **lookout posts** usually consist of niches dug in the interior slope of the trench and covered from the rear by a sandbag wall and on top by a splinter-proof layer (boards or logs with a top layer of sandbags).

1169b. The loopholes are reserved for the lookouts for watching the enemy and for harrassing fire; during combat, the men fire over the parapet. Loopholes are made of wood, sandbags, metal shields, etc. (Figs. 52, 53, 54, and 55.)

The exterior opening should be concealed by a cord trelliswork or other means that will allow the barrel of the rifle to protrude.

It is essential that the enemy should not be able to distinguish whether the loophole is manned or not. The loophole must not therefore have as a background the sky, or a wall, or other object whose color contrasts with that of the trench. A cloth may be hung behind the head of the lookout to furnish the background.

Whenever possible, the loophole should be oblique with respect to the enemy's trench; the lookout is better protected, and the loophole is less visible (see fig. 56).

Miscellaneous.

Plans for automatic-rifle positions, snipers posts, ammunition recess, and latrines are shown in figures 56, 57, 58, 59, and 60. Latrines should be dug as deep as possible under existing conditions and should have covers to keep out flies. They should be disinfected frequently. Men should cover their excreta with earth. They should be dug in as lateral trenches from communication trenches and parallel to the main trenches.

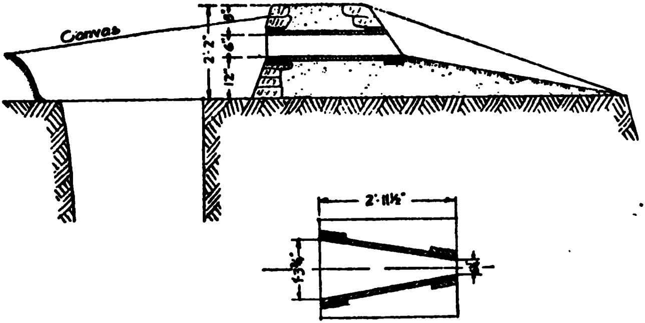


FIG. 52.—Loophole of wood.

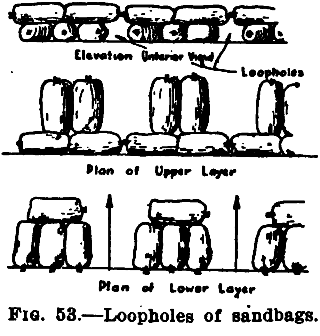


FIG. 53.—Loopholes of sandbags.

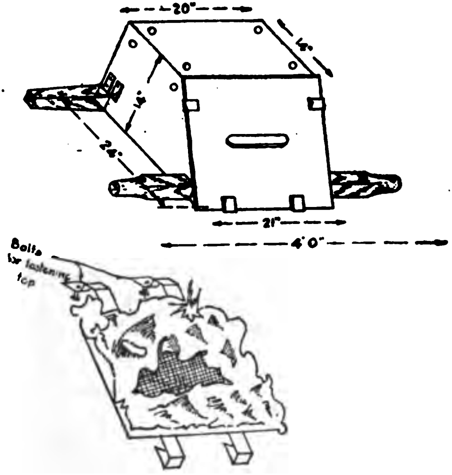


FIG. 54.—Portable armored observation post.

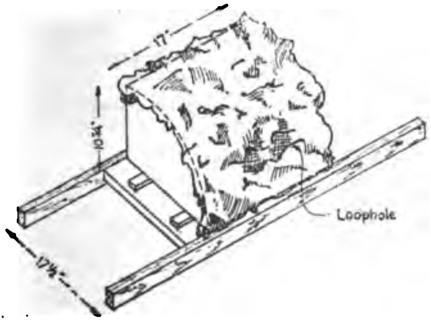


FIG. 55.—Roll-top steel observation post.

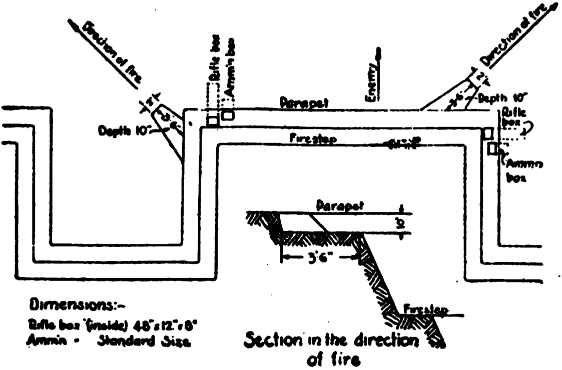


FIG. 56.—Automatic rifle positions.

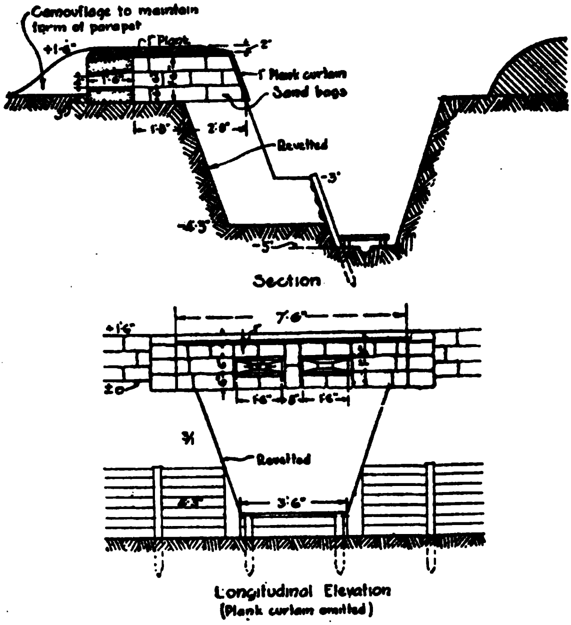


FIG. 57.—Snipers' post.

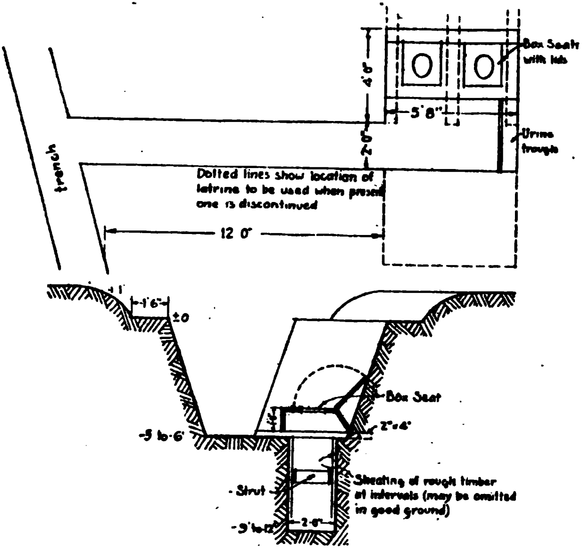

Box Seats with lids
4'0"
5'8"
2'0"
Urine trough
trench
Dotted lines show location of latrine to be used when present one is discontinued
12 0"
+1'
1'6"
±0
Box Seat
2"×4"
-5' to 6'
Strut
Sheating of rough timber at intervals (may be omitted in good ground)
2'6"
-9' to 12'

FIG. 58.—Deep latrine, box-seat type.

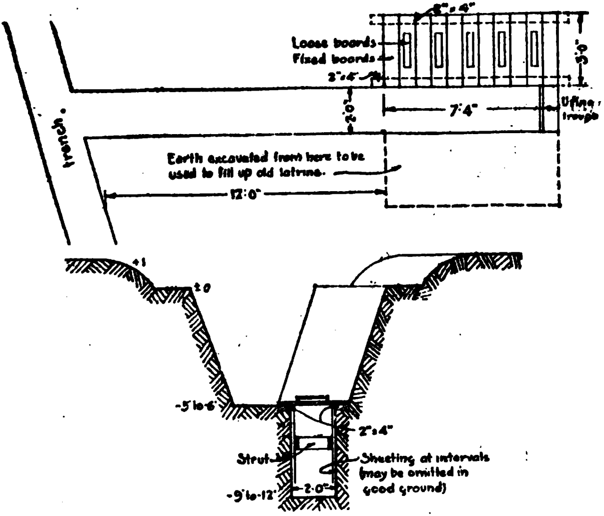
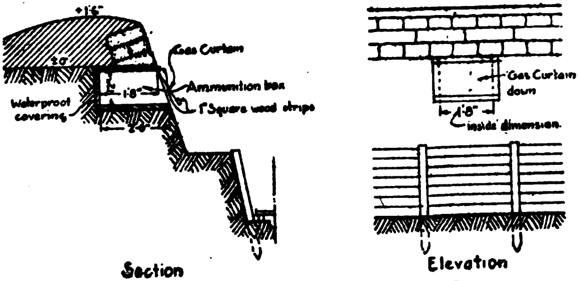

2"×4"
Loose boards
Fixed boards
2"×4"
5'0"
2'0"
7'4"
Urine trough
trench
Earth excavated from here to be used to fill up old latrine.
12'0"
+1
±0
-5' to -6'
2"×4"
Strut
Sheeting at intervals (may be omitted in good ground)
-9' to -12'
2'0"

FIG. 59.—Deep latrine, straddle type.



Section

Elevation

FIG. 60.—Standard ammunition or grenade box.

Machine and Field Gun Emplacements.

1170. **Machine guns** are employed in the fire trenches or in specially prepared emplacements in the intervals.

Artillery is usually placed behind the line of infantry defense, natural cover being utilized as far as possible.

When an artillery position is in flat terrain which is visible to the enemy, gun pits may become desirable to increase the concealment. The diagrams, figures 61 and 62, show types of hasty and deliberate intrenchments. These afford no cover from overhead fire or from observation by aircraft.

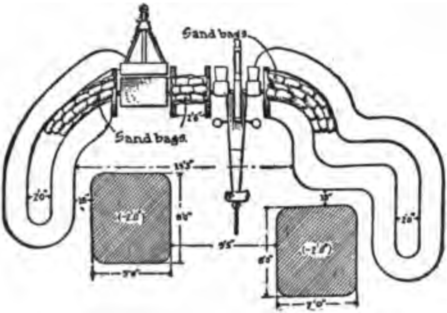


FIG. 61.

Sec. IV.—HASTY INTRENCHMENT UNDER FIRE.

1171. The work must be done by the men lying prone on the left side.

Men first shift their positions as necessary to obtain a clear field of fire to the front. The work is then executed as follows:

Lie back about 2 feet from the selected position and to the left of it, head at the point *X*, figure 63. Tear up any vegetation available, and heap it up loosely as a screen at full arm's length to the front.

Lying on the left side and using the intrenching tool, hack the earth loose into a furrow about 1½ feet to the right of the body and extend it as far to the front and rear as possible. Scoop out the earth and heap it close in front of the left eye and shoulder.

Dig toward the body from the original furrow so that the blade of the intrenching tool is worked under the hard surface crust. Continue to scrape the earth toward the parapet and to widen the trench until it is about 1½ feet wide. Any lumps available should be used to build up the near edge of the parapet as steeply as possible. The earth should be so disposed as to thicken the parapet in a line between the head and the point from which the most accurate fire appears to come, or, if necessary, extend the parapet in the shape of a horseshoe around the front of the trench.

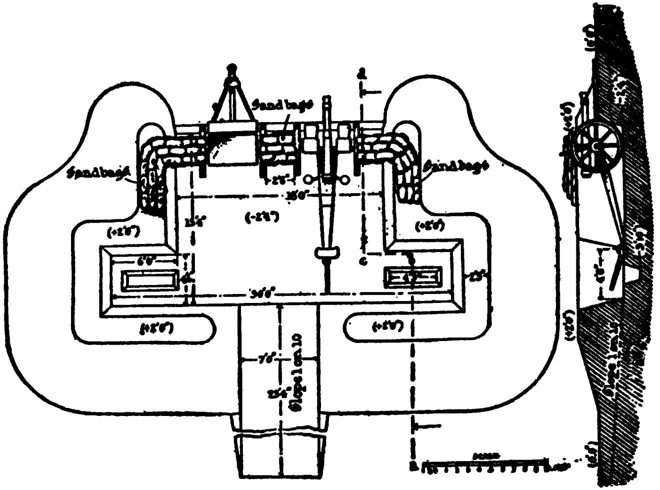


FIG. 62.—Deliberate intrenchment for field artillery. Suitable type when depression is necessary for concealment.

When the depth of the trench reaches about 6 inches in front and 12 inches in rear, and the parapet is 6 inches high and bulletproof (a thickness equal to the length of the rifle is sufficient), some vegetation, if any is available, should be scattered over the parapet to conceal the fresh earth.

Each man must be ready to lay down his intrenching tool and to resume firing with his rifle at any stage of the work.

1172. Adequate cover at close range can not be obtained in less than 35 minutes. This form of trench is ineffective against shrapnel fire. A rifle pit from 1½ to 2 feet deep and as narrow as practicable, with a parapet about 1 foot high, is the best hasty shelter against artillery fire.

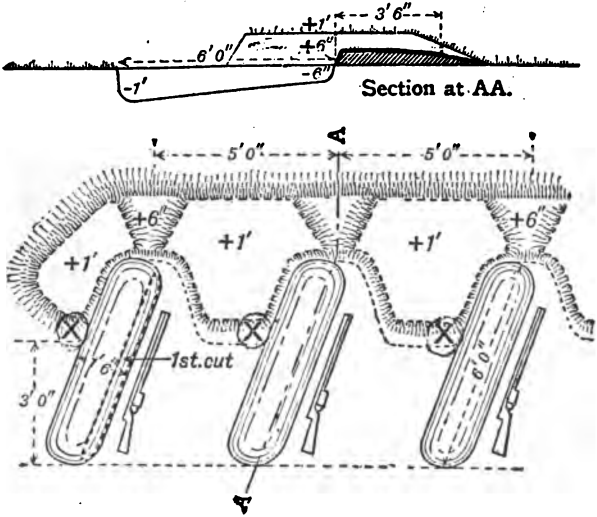


FIG. 63.—Early stages of intrenchment by riflemen lying prone in the open, using intrenching tool under fire. If under shrapnel fire all efforts should be directed towards making a deep hole and not a shallow trench.

To construct such cover from the skirmisher's trench, excavate the pit at the point occupied by the elbows, until sufficient cover has been obtained.

Sec. V.—OBSTACLES.

1173. In field warfare, the amount of artificial obstacles which can be prepared will be extremely limited, unless materials, time, and labor are abundant, and great discrimination is necessary in order to make the most of available resources.

There are three objects to be kept in mind in arranging a system of obstacles, viz:

1. Obstacles should break up the unity of action and cohesion of the attacking troops.
2. They should tend to deflect the parties thus isolated into the best swept fields of fire.
3. They should finally arrest the attackers under the close fire of the defenders.

1174. Obstacles naturally divide into **deflecting obstacles** and **barrier obstacles.** Deflecting obstacles may be placed at any distance from the firing points, but should be under effective fire. Natural obstacles on the ground, such as hedges, fences, ditches, walls, etc., are modified to act as isolating and deflecting obstacles.

1175. Barrier obstacles should be under fire throughout every yard of their length and within close range of the defenders. No part of the obstacle should be farther than 100 yards away; in the World War it has been customary to place them much closer. The following requirements should also be considered in the construction of barrier obstacles:

1. They should be as wide as time and material will allow.
2. They should afford no cover to the enemy.
3. They should, if possible, be sheltered from artillery fire.
4. They should be strongest at those points which are under the least effective fire.
5. They should be difficult to remove or destroy, to cut through, or to crawl under, or climb over.
6. They must not betray the firing points and must be concealed.
7. They should be constructed with passageways, well covered by fire, to permit the ready advance of the defenders.

1176. The most usual obstacles are the following:

1. **Heavy abattis.**—Large trees felled side by side, branches toward the enemy, and interlaced with support wires (usually barbed wire), closely interlaced.
2. **Light abattis.**—Branches cut off trees, crowded together, securely anchored down to the ground, and interlaced with wire as above.

3. **Tree entanglements.**—Medium-size trees cut nearly through, 3 or 4 feet above the ground; branches forced down to the ground and securely pegged down and the stumps used as posts for a strong wire fence; the branches are interlaced with wire.

4. **Wire entanglements.**—Fully treated below.

5. **Inundations.**—The flooding of areas is most effective, but ordinarily expeditionary forces will not require such an expedient in their prosecution of military operations.

Sec. VI.—WIRE ENTANGLEMENTS.

1177. Infantry will be trained in the construction of low wire entanglements, the double-apron fence, and portable wire obstacles (pars. 1184; 1185, 1186).

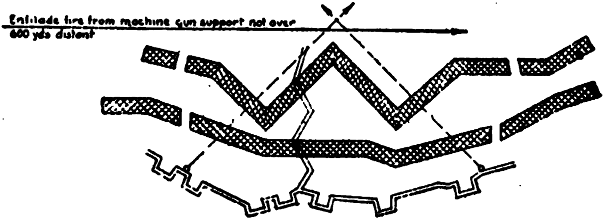

Enfilade fire from machine gun support not over 600 yds distant

FIG. 64.—Enfilade of entanglement.

General Principles.

1178. Barbed-wire entanglements should be located in accordance with the following principles:

(*a*) They must be covered at every point by our own rifle or machine-gun fire, either frontal or enfilade. Special emphasis must be laid on the principle that the entanglement and machine-gun positions should be so sited with reference to each other that the front of the entanglement is swept by the fire of machine guns. This is the most important consideration in siting barbed-wire entanglements (see fig. 64). Obstacles have no inherent value of their own; they serve only as an auxiliary to the fire power of the troops. If the attack succeeds in neutralizing the troops behind the wire, the entanglement is valueless.

(*b*) They must not be so far from the trench that they can not be kept under observation and control at all times, especially at night.

(*c*) They must not be so close to our own trench as to permit the enemy to approach to bombing range of the position without being discovered. A distance varying from 30 to 60 yards will generally be most suitable.

(*d*) They must be concealed as much as possible from the enemy's observation, both terrestrial and aerial, especially from his ground artillery observation stations. Full advantage should be taken of depressions in the ground, tall grass, woods, and reverse slopes.

(*e*) The belt of wire should, as far as possible, avoid paralleling the fire trench; and in addition it should be irregular in width and height. The first consideration will prevent the enemy artillery from ranging on the trenches to destroy the entanglement; the second, from knowing definitely when the wire has been destroyed.

Special precaution must be taken in locating the entanglement to avoid indicating the manner in which the ground is occupied.

Design.

1179. The following principles govern the design of the entanglements:

(*a*) Within limits, a broad, thin entanglement is better than a narrow, thick one; the former, while equally effective, is less liable to destruction by artillery fire, as well as less visible.

(*b*) Two belts of entanglements, separated by a space of from 10 to 50 yards, are better than the same amount of entanglement in one belt.

(*c*) The entanglement must be well supported and anchored to the ground by means of pickets and posts, so as to be difficult to flatten out or drag aside.

(*d*) Sufficient barbed wire must be used to prevent easy penetration. Some loose tangled wire in the entanglement is difficult to clear aside after the wire is cut.

(*e*) The entanglement should be provided with blinded gaps for the passage of our men. A gap of about 12 feet in every 50 yards is usually left. Means to block the gaps must be at hand (figs. 65 and 70).

(*f*) The entanglement should present in its first stages an obstacle behind which the wiring party can work under protection and which can be subsequently added to and improved as desired.

Matériel.

1180. The following data is descriptive of the matériel employed in the construction of entanglements:

(1) **Barbed wire:**

(a) *Length.*—The length of wire on a reel varies from 50 yards to 100 yards. Reels will, if possible, be issued in standard 50-yard lengths.

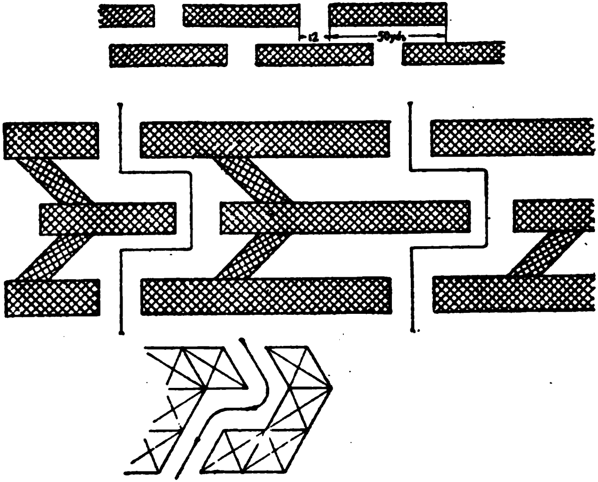


FIG. 65.—Gaps in belt of wire.

(b) *Weight.*—The weight, including drum, is about 28 pounds for the 100-yard reel and 15 pounds for the 50-yard reel.

(c) *Marking end of wire.*—The plain wire securing a reel of barbed wire must be cut, and a piece of sandbag or white cloth tied to the running end, in order that there will be no difficulty in finding it at night; the pieces of tin on the wooden drums must be broken off to prevent noise. These preparations must be made before the matériel is taken out for work.

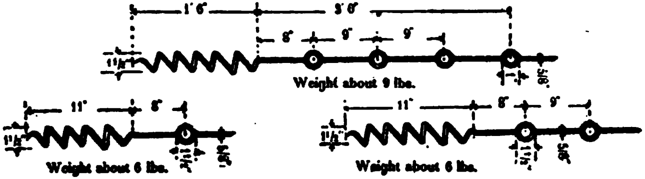


FIG. 66.

(2) **Pickets:**
(*a*) *Wooden*—

	Long.	Short.
Length	5 feet	2½ feet.
Diameter	3 to 3½ inches	2½ to 3 inches.

(*b*) *Screw* (see fig. 66)—

	Long.	Medium.	Short.	Anchorage.
Length	5 feet	3½ feet	1½ feet	
Diameter	⅝ inch	⅝ inch	⅝ inch	
Weight	9 pounds		6 pounds	3 pounds.

(*c*) *Angle iron*—

Length, 5 feet 10½ inches and 3 feet 6 inches.
Weight, 10 pounds and 6 pounds.

(*d*) All bundles of screw and iron pickets should be prepared for carrying by being wrapped with a sandbag and secured in at least two places by a turn of plain wire with the ends twisted together. Enough wire must always be left at the ends so that it can be untwisted by hand without pliers.

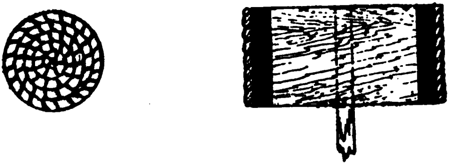
(*e*) Bundles of long wooden pickets should be tied together in at least two places with plain wire. Short wooden pickets are best carried in sandbags, eight in each bag; two bags are tied together and slung over the shoulder.

(3) **Wire cutters:**

It very seldom occurs that there are enough wire cutters to give a pair to every man in a wiring party which consists of not more than 25 men. If stores have been properly prepared beforehand, there is no necessity for more than two pairs to each party, which should be carried for use in emergency.

(4) **Mauls:**

Coiled rope should be fastened on end to deaden sound (fig. 67). Where rope is not available, sandbags should be carried for use as mufflers on heads of pickets.



Face of maul

Sideview of maul

FIG. 67.—Coiled rope on maul.

1181. The task of throwing loose wire into an entanglement is a long and tedious one. It is made very much easier and quicker if the wire is coiled in a spiral beforehand. Spirals are prepared in accordance with the following methods:

Drive two 3-foot stakes, 3 feet apart, and two more, at right angles to the first two, 1.5 feet apart (fig. 68). Then wind 75 yards of barbed wire around the diamond-shaped framework thus formed, gradually working it up the stakes in a spiral. Finally, take the spiral off the stakes and tie it together in four places with plain wire.

A man can easily carry a spiral thus made on his shoulder in a trench.

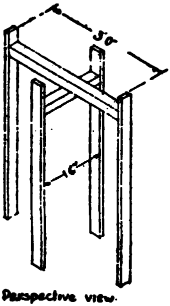


FIG. 68.—Framework for making spirals.

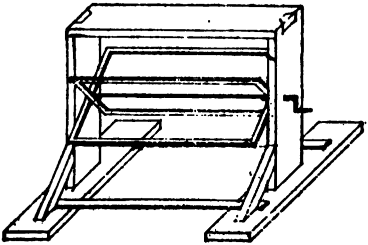


FIG. 69.—Winch for making spirals.

1182. The following are convenient approximations of man loads:

	Number.	Average total weight.
Wooden pickets:		*Pounds.*
Long	4	....
Short	16	....
Screw pickets:		
Long	4	36
Medium	6	36
Angle-iron pickets:		
Long	4	45
Short	6	27
Barbed wire:		
100-yard reel	1	28
50-yard reel	2	30
Loose wire—spirals	1	20
Anchorage pickets	8	26

Time and Men Required.

1183. The following table, showing time and men required to construct the different standard entanglements, is based on the assumption that work is carried out under the following conditions, with good average parties, not picked men:

(*a*) Stores are taken up by a separate carrying party as far as the fire trench only.

(*b*) The entanglement is erected 40 to 50 yards from the fire trench; stores have, therefore, to be carried out that distance by the wiring party.

(*c*) Men work equipped to meet attacks.

Pattern and length.	Wiring party.		Carrying party.		Average time by daylight.	Average time by night.
	P. O.	Men.	P. O.	Men.		
					Min.	*Hours.*
50 yards low or knee-high wire	1	7	1	17	30	1-1¼
50 yards double apron fence	1	9	1	15	30	¾-1

The size of the carrying parties should be so regulated as to avoid delaying the wiring party on account of lack of material. The carrying parties defined in above tables can carry *at one trip* sufficient stores for 50 yards of entanglement. If more than 50 yards are to be constructed and all the material is to be carried in one trip before the wiring party commences work, the carrying parties must be proportionately increased. If, for example, 200 yards of entanglement are to be constructed, a carrying party of four times the strength of that given will be necessary. If, on the other hand, the wiring party is to be supplied by *repeated trips* of the carrying party, the amount of wire carried at each trip must be sufficient to supply the wiring party until the next return of the carrying party, and the time required for the round trip to the matériel depot must therefore be considered. If, for example, the round trip to the matériel depot required 1 hour and the length of the entanglement is 200 yards or more, the strength of the carrying party required will be twice that given in the table.

For long lengths of entanglement (over 100 yards) a small additional carrying party of three or four men is formed to supply the wiring party with material for the fire trench and to serve as replacements for casualties.

Description of the Standard Obstacles.

Low (or Knee-High) Entanglement.

1184. This entanglement (fig. 76) consists of three rows of medium pickets, a horizontal wire along the top of each row, one diagonal wire in each of the two bays formed by the three rows, and, finally, loose wire thrown into the bays.

It is not a very effective entanglement; its chief value lies in the fact that it is not conspicuous. It is the slowest entanglement to erect at night, if screw pickets are used, as the latter are very hard to find. This difficulty can be overcome by laying down a spun yarn line or tracing tape.

Double-Apron Fence.

1185. This entanglement (fig. 77) consists of four horizontal strands on the fence and three (including the trip wire) on each apron.

Belts of double-apron fences form an excellent framework for a wide obstacle; loose wire can be thrown in between the bays for thickening purposes.

Portable Wire Obstacles.

1186. These special forms consist of various different shapes of framework upon which barbed wire is strung. They are used:

(*a*) To block gaps in the entanglement.

(*b*) As an emergency obstacle thrown out in front of the trenches.

(*c*) To barricade narrow streets in defended villages and trenches leading toward the enemy.

(*d*) To make emergency repairs to entanglements partially destroyed by the enemy's fire.

1187. The principal form of portable obstacle for use by infantry is the knife rest. This obstacle consists of a framework of wood or iron, upon which barbed wire is strung. The iron framework is collapsible and hence easier to transport than the wooden type; it has the further advantage of greater invisibility and strength. In shape the framework of the knife rest resembles a common sawbuck. It is the most used of the portable obstacles. (See figs. 70 and 71.)

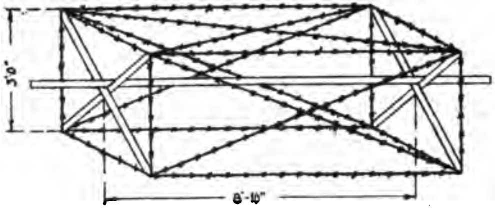
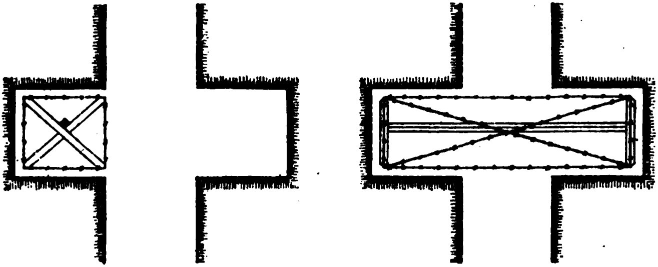


FIG. 70.—Large knife rest (wood).



Knife rest in first position

Knife rest in second position

FIG. 71.—Method of blocking trench with knife rest.

Wire Drills.

General Rules.

1188. The following general rules apply to all drills. (See figs. 76 and 77.)

A. **Order of work:**

In the following drills all men have been given a number and the several groups a letter; the tasks should be initiated in the order in which the men are numbered, and the groups should work in echelon in the same direction, so that the men doing different tasks will not be in each other's way and groups never cross paths.

B. **Pickets:**

(*a*) *Spacing.*—The p. o. determines the location of the pickets in one row by means of pacing; in the other rows the pickets are located by eye opposite the center of the intervals in the preceding row.

(*b*) *Laying out.*—Pickets should always be carried under the left arm and placed on the ground with the right hand and in such a way that the end of the screw or the point of the picket faces the enemy, indicating the spot at which the picket is to be erected.

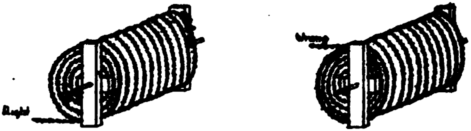


FIG. 72.—Right and wrong way of running out a coil of barbed wire.

(*c*) *Erection.*—Screw pickets must be screwed in so that the loops are parallel to the length of the entanglement and the top loop points in the direction from which the men are working, i. e., toward the starting point. This rule is essential in order to facilitate placing wires.

(*d*) *Anchor pickets.*—Wooden pickets used as holdfasts should be driven in roughly at right angles to the stay wire attached to them, but screw anchorage pickets must be directed in prolongation of the stay wire to avoid being drawn in the direction of the strain.

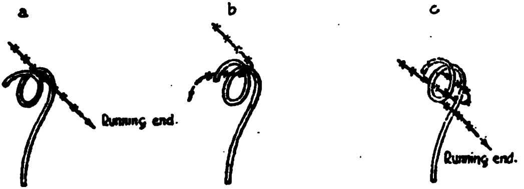
C. **Running out wires:**

In running out barbed wire two men work together; one man holds the reel and the other stretches the wire and fastens it to the pickets. The stake on which the reel is carried must be small enough to permit the coil to revolve easily, and it must be so held that the wire runs from underneath the reel, as otherwise the wire tends to rise into the holder's face. (Fig. 72.)

D. **Fixing wires:**

(*a*) Men fixing the wires must always work facing the enemy.

(*b*) To fix wire in top eye of screw picket: Pull the standing end taut and slip the wire up into the eye; turn the running end up over the eye, thus threading the wire in the eye; then take a turn with the running end around the picket below the eye. (See fig. 73.)



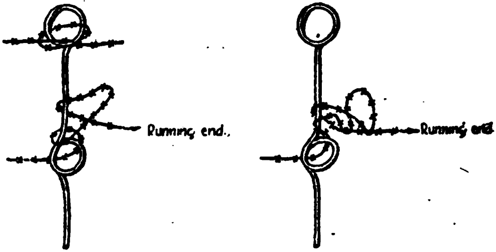
Top eye with wire forced up into it.

2nd Operation. Running end turned over towards the end of loop.

Wire threaded in eye and around turn taken below the eye

FIG. 73.—Method of fastening barbed wire on picket.

(*c*) To fix the wire in lower eye of screw pickets when there is already a wire in the top eye:



Wire forced up into a lower eye of picket and the bight taken round the picket above the eye.

Bight finished off on the running end

FIG. 74.—Method of fastening barbed wire on pickets.

(1) Pull the standing end taut and slip the wire up into the eye. Then take the bight on the running end, pass it around the picket above the eye, then finish off by taking a turn with the bight on the running end (see fig. 74).

(2) If one eye is on the opposite side of the pickets from the others, the wire must be forced down into the eye, and the bight on the running end passed around the picket under the eye.

The above rules, (*b*) and (*c*), apply in whichever way the wire men are working, from right to left or left to right; if they are carried out, the wire is firmly fixed in the eye and can not slip up or down the picket; also, if one bay is cut, the wire in the bays on either side remains taut and does not slip through the eyes.

(*d*) To fix the wire to wooden pickets, take two turns around the picket, the second turn binding the first.

(*e*) To fix one wire to another adjacent to it, a short length of smooth wire may be used, or the two wires may be twisted together by means of a rack stick as shown in Figure 75. This method is known as "windlassing."

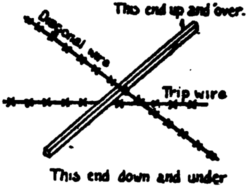


FIG. 75.—Windlassing wire.

E. **Loose wire and trip wire:**

The addition of loose wire and a trip wire makes the entanglement more efficient. The organization of the wiring party is so arranged as to allow two spare men for this task. If circumstances require the omission of the trip wire and the loose wire, the organization of the rest of the party is not affected.

Drill 1.

1189. *Drill for 50 yards length standard low (or knee-high) wire entanglements.*

Materials:

(1) Nine bundles containing six medium pickets each.
(2) Two 100-yard coils and three 50-yard coils of barbed wire.

Tasks of wiring party.

Group.	No.	First task.	Second task.	Third task.	Fourth task.	Fifth task.
P. O.		Direction and supervision.				
A	1 2 3	Carry out 3 bundles pickets and 2 coils (100 yards) barbed wire.	Lay out and screw in center line of pickets.	Diagonal wire in enemy bay.	Diagonal wire in home bay.	
B	4 5	Carry out 3 bundles pickets and 3 coils (50 yards) barbed wire.	Lay out and screw in outer line of pickets.	Horizontal wire on outer line of pickets.	Horizontal wire on center line of pickets.	Horizontal wire on inner line of pickets.
C	6 7	Carry out 3 bundles pickets and 4 spirals.	Lay out and screw in inner line of pickets.	Loose wire in enemy bay.	Loose wire in home bay.	

(3) Four spirals.

Wiring party:

One p. o. and seven men. The p. o. carries cutting pliers, and each of the party a windlassing stick; gloves as required.

Carrying party:

One p. o. and 17 men.

Details:

(1) The p. o. leads out the whole party and has all his stores dumped in some convenient place behind or near the head of the task. Each group is responsible for its own stores as detailed above; A being the larger group will be ready first.

(2) When ready the p. o., followed by Nos. 1, 2, and 3, paces out the center line and indicates to No. 1 where to lay pickets. As soon as No. 1 has finished his bundle, he screws in 6 pickets. The p. o. follows the same procedure with Nos. 2 and 3, who complete the laying out of the center line.

(3) As soon as the p. o. has thus laid out his center line of pickets, he returns to the head of the task and supervises the laying of the outer and inner line of pickets by B and C groups.

(4) As soon as A group has finished its pickets, it returns to the head of the work and puts on the diagonal in the outer bay. No. 1 runs out the coil, No. 2 fixes wire on the outer line of pickets, and No. 3 fixes the wire on the center line of pickets.

(5) As soon as B group has finished its pickets, it returns to the head of the work and puts the horizontal wire on the outer line of pickets; No. 4 runs out the coil and No. 5 fixes the wire on the pickets.

(6) As soon as C group has finished its pickets, it throws the spiral wire into the outer bay, two spirals in each 50-yard bay.

(7) When B group has finished the horizontal wire on the outer line of pickets, it comes back to the head of the work and puts the horizontal wire on the center line of pickets. Similarly, A group and C group return to the head of the work and repeat in the home bay the operations described in (4) and (6).

(8) Finally B group puts the horizontal wire on the inner line of pickets.

Drill 2.

1190. *Drill for 50 yards standard double-apron fence.*

Materials:

(1) Four bundles containing 4 (long) pickets each.

(2) Four bundles containing 8 anchorage pickets each.

(3) Fourteen 50-yard coils barbed wire (or two 100-yard coils) and ten 50-yard coils.

Wiring party:

One p. o. and 9 men. The p. o. carries cutting pliers, and each of the party a windlassing stick. Gloves as required.

Carrying party:

One p. o. and 15 men.

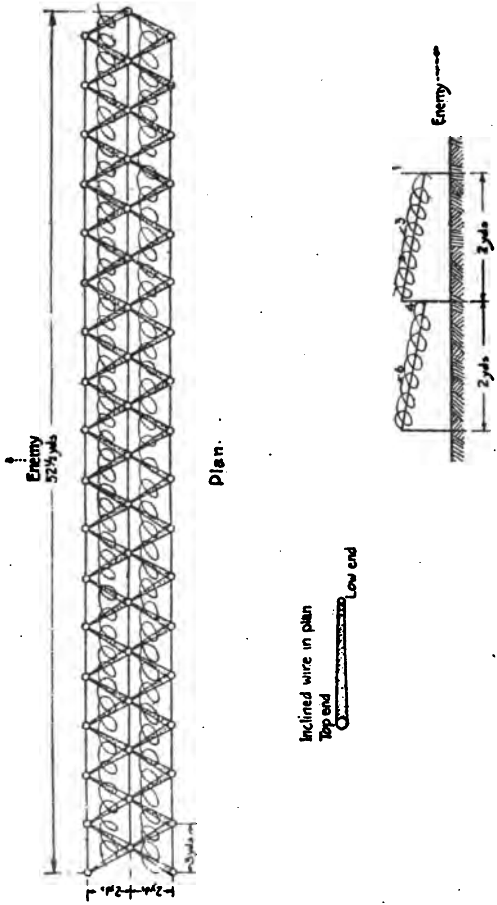


FIG. 76.—Order of putting on the wire.

Tasks:

Group.	No.	First task.	Second task.	Third task.	Fourth task.	Fifth task.
P. O.		Direction and supervision.				
A	1 2 3	Carry out 3 bundles pickets.	Screw in long pickets.	Front diagonal wire.	Bottom wire on fence.	Rear diagonal wire.
B	4 5	Carry out 2 bundles anchorage pickets.	Screw in front anchorage pickets.	Front trip wire.	Second wire on fence.	Top horizontal wire on rear apron.
C	6 7	Carry out 2 bundles anchorage pickets.	Screw in rear anchorage pickets.	Second horizontal wire on front apron.	Third wire on fence.	Second horizontal wire on rear apron.
D	8 9	Carry out 1 bundle of pickets and 14 coils barbed wire.		Top horizontal wire on front apron.	Top wire on fence.	Trip wire on rear apron.

Details:

(1) The p. o. leads out the whole party to the head of the work, and A, B, and C groups undo their bundles when ready. The p. o. paces out and indicates to A group where to lay its pickets, commencing with No. 1 and finishing with No. 3. Having done this, the p. o. returns to the head of the work, picks up the fourth bundle which D group has brought out, walks back again, and lays out this bundle; all numbers of A group, as they finish four pickets, join the p. o. and screw in the last four pickets.

(2) Meanwhile B and C group, getting the direction from the center line of the long pickets, lay out and screw in the whole of the anchorage pickets, No. 4 being responsible for the anchorage picket at the head of the work, and No. 7 for the anchorage picket at the end of the work. Each number of both groups lays out and screws in his own bundle of pickets.

(3) Meanwhile, D group brings out the remainder of the stores and dumps them at any convenient spot indicated by the p. o. This requires each man to make four journeys.

(4) As soon as A group has finished its pickets, it returns to the head of the work and puts on the front diagonal wire. No. 1 runs

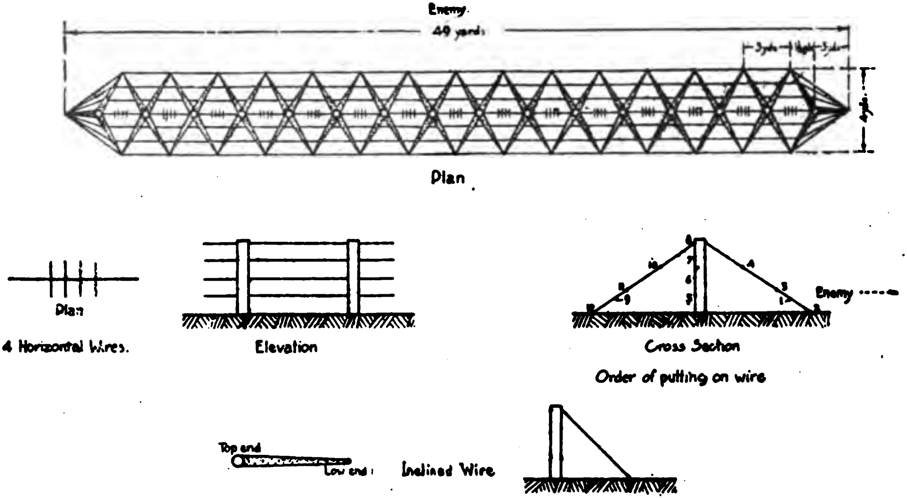


FIG. 77.—Fifty-yard standard double apron fence.

out the coil, No. 2 fixes the wire on the pickets, and No. 3 fixes the wire on the anchorage pickets.

(5) As B, C, and D groups finish their second task (see tasks), they return to the head of the work and put the horizontal wire on the aprons. Nos. 4, 6, and 8 respectively run out the coils, while Nos. 5, 7, and 9 windlass the wires on the diagonal wire. In doing this, Nos. 5, 7, and 9 should not step over the diagonal wire but walk around the posts, lifting their wire over the posts, and then down into position on the diagonal wire.

(6) As they finish each task, the various groups return to the head of the work and take up the next task in the order given.

All men work behind the wire at all times.

Nos. 1 and 2 must be careful to put the diagonal wire on rather slack; it automatically tightens when the horizontal wires are windlassed on.

All diagonal wires and apron wires are begun and finished on the end anchorage pickets. The horizontal strands on the fence are not carried down to the end anchorage pickets.

If wooden or angle-iron pickets are used, Nos. 1 and 2, and No. 3 and the p. o. work together, No. 2 and the p. o. holding up the pickets while Nos. 1 and 3 drive them in with the maul.

Sec. VII.—DEFENSE OF TOWNS AND VILLAGES.

General Principles.

1191. Villages.—Villages of well-built houses can often be turned to excellent advantage for defensive purposes, and the issue of many important battles has depended on their capture. The outer buildings and inclosure walls facing the attack not only afford a strong firing line, but the interior and rear of the village furnish good cover for supports and reserves. An obstinate step-by-step defense can be arranged by the use of interior buildings and street barricades.

In preparing a village for defense, the strong main line should be provided along the outer edge by putting walls of buildings and inclosures in a defensible condition. If the village is subjected to artillery fire, the main line of defense should be placed in fire trenches a short distance in front of the outer line of the village with ample covered communications leading to the rear. The front lines should be divided into definite sectors of defense to which complete units, companies or battalions, are assigned. Interior lines of defense may be prepared along streets parallel to the front, and a final stand made in any strong central building in an open space, such as the church or courthouse. Machine guns can be used effectively from behind barricades sweeping the streets leading to the front. Good communications are an important feature in the defense of a village, and these should receive especial care, the necessary openings through walls being provided for this purpose. Artillery for the defense of villages should be placed outside and to the rear of the flanks.

1192. To occupy a village as a military post, the following general rules should be observed:

First select some suitable and substantial building as a stronghold, and determine whether it would be best to occupy the whole village, or a part only. Avoid wooden houses and thatched roofs, and prefer brick houses to those of stone, selecting such as mutually flank each other. Take care that the amount of ground occupied be not in excess of the number of men available for the defense. Salient points must be strengthened as much as possible; all houses not occupied by the defense which may be of the least use to the attack must be demolished. *Outside* the defenses, destroy all walls, thick hedges, and any cover which may be parallel generally to the place, and leave such as may be perpendicular to it, and which will therefore be enfiladed and cause obstruction. *Inside* the place, reverse this rule; *wet* ditches, pailings, and thin hedges outside the place may be left. Hedges, walls, etc., may be incorporated with the general line of

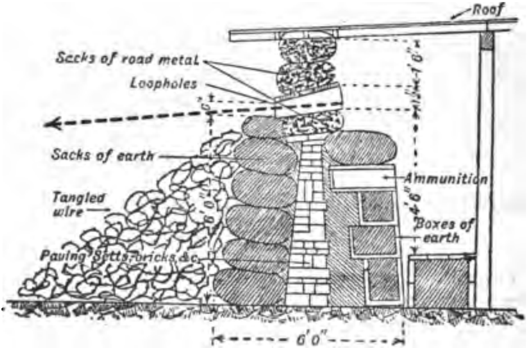
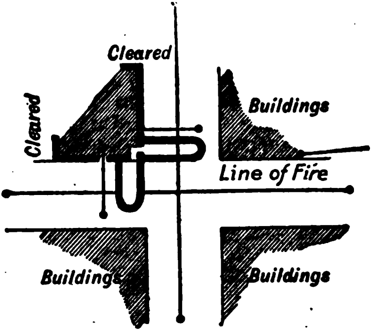


FIG. 78.—Obstructions: Defensive street barricades.

defense. Long walls may receive flank defense by means of *tambours* or projecting small angular stockade-works; communications may also be thus covered. The streets may be barricaded and the houses loopholed; great care must be given to the communications with the stronghold, and also that barricades be not in position to be taken in reverse; in this case other barricades must be formed in rear.



Arrangement of Street Stockades to fire four ways.

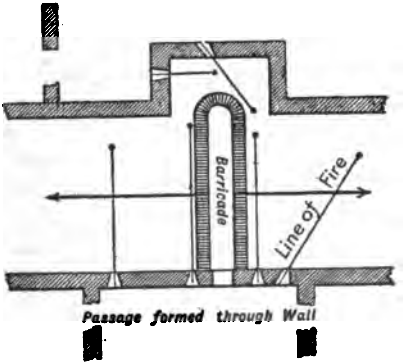


FIG. 79.—Defensive street barricades.

1193. It may be mentioned here that walls and buildings form a dangerous background for men close in front of them, on account of the ricochet from bullets which strike the wall and glance off; and *fire cover should never be made in such situations without an ample back parapet or parados of soft material*. Walls or houses should never be relied on as a position for the main firing line in any situation exposed to artillery fire. Their principal value is for the control of streets in the heart of a town, and other situations where they can not be located by the enemy's artillery.

1194. Houses.—Loopholes should be made in the walls and at the angles. The upper windows need not be barricaded throughout, but must be so to a height of 6 feet from the flooring. Balconies may be strengthened and made bullet-proof, being loopholed at the base in order to give fire from beneath to the foot of the wall; suitable overhanging constructions of a similar nature may be formed by beams of timber, these being passed through the wall and secured inside to the joists of the flooring; it would be advisable to construct them over outer doors. Especial care must be given to the communications inside the building, staircases being partially removed and ladders substituted. If the outer wall be liable to be weakened by artillery fire, the flooring inside should be supported by stanchions.

Plenty of water must be available, in casks, etc., within the building. All windows and doors of the lower stories should be well barricaded and secured, and ditches cut around the house.

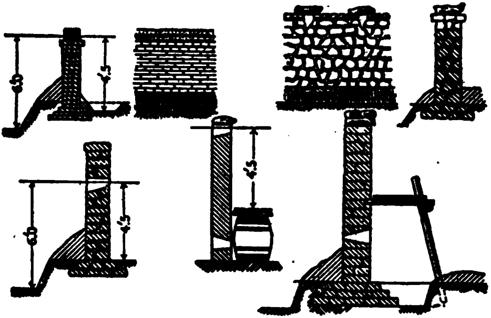


FIG. 80.—Methods of loopholing walls at various heights.

1195. Figs. 81 and 82 illustrate particular examples of firing from behind the walls of houses. The occasions when it is permissible to make use of buildings as fire cover have already been discussed. *As a general rule it will be quicker to make use of the existing openings—namely, doors and windows—than to cut fresh loopholes.* The treatment illustrated in these figures is applicable to either a door or a window.

In Fig. 81 a window opening is shown blocked with a pile of sacks, boxes, trunks, a chest, cupboard filled with bullet-proof material, with a loophole for shooting through. The *height* of the loophole opening is determined by the amount of depression required in firing. A *width* of 2½ to 3 inches will usually be ample.

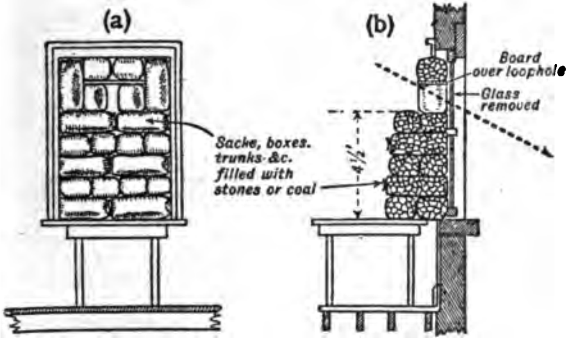


FIG. 81.—Window prepared for rifle fire.

NOTE.—If a narrower support than the table shown can be obtained for the sacks, etc., the rifleman can stand on the floor, and less material will be needed to provide cover.

1196. In Fig. 82 a large gateway or door is shown boarded across on the inside, and the boarding shored up by struts which bear against a beam nailed to the floor, or if laid on the ground, kept in place by pickets driven behind it, and a bar above nailed to uprights, which in their turn support and strengthen the boarding. The hollow space between the boarding and the door, *which should not be less than 6 inches*, is filled with small stones, road metal, etc. Loopholes may be made of rough board similar in shape to Fig. 52. Windows may be treated in the same manner, the glass being first removed in all cases.

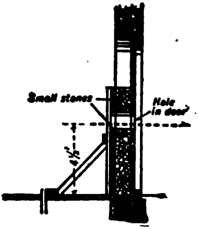


FIG. 82.—Door prepared for rifle fire. (Boarded up on inside.)

Sec. VIII.—DEMOLITIONS.

1197. The demolition of material objects forms an important accessory of tactical operations in war. It serves to hamper the movements of the enemy, to frustrate his plans, and, by the removal of obstacles, to facilitate the operations of our own forces. Demolition is permissible only as a military necessity and should be carried no further than military necessity demands.

In time of peace demolition may be used to prevent the spread of conflagration, or for similar purposes, where the value of the objects saved may greatly exceed that of the objects destroyed.

1198. The **means of demolition** best adapted to military purposes are **fire** and **explosives**; **mechanical means** may also sometimes be used. Which of these is best in a given case depends on the circumstances. If time permits and there is little danger of fire spreading farther than intended, it is easier and simpler to burn docks and buildings than to use explosives. Explosives are specially suited for destroying iron and brick structures, or masonry bridges, etc. Again, a timber bridge will fall if cut, and explosives furnish a means for doing this without being on it at the time; but if not pressed for time burning is as good, or better.

Destruction by mechanical means is too simple to require and too varied to permit detailed description. Where absolute destruction is required, as in case of food supplies, munitions of war, structural materials, etc., fire is the only recourse.

1199. **Demolitions by the landing force** are not likely to be extensive. Where explosives are required, the outfit is largely improvised from the charges of the naval defense mines that ships carry. Where much demolition work has to be done, dynamite or ordinary blasting powder can probably be acquired for that purpose. These materials, though not suitable for carrying on shipboard are so widely used that they are cheap and readily obtainable in large quantities.

Trinitrotoluol, being a service explosive, may perhaps be used for demolition work. Loose T. N. T. can be made up in sausage form, in bags of light duck, and is very convenient in that form. Wire nails can be safely driven through it to attach such tubes around timbers in an encircling chain, and the detonators stuck in through slits made with a knife. These tubes are convenient to carry, they can be cut to desired length with a knife, and the ends tied with twine after dumping a little out. In blowing up flat shapes a primer on each side should be used to insure good detonation, particularly if the tube is thin.

1200. The **strength** of the various types of explosives differs somewhat, both with their nature and with the means of detonation. But for the purposes of the landing force, all forms of high explosive, such as dynamite, T. N. T., gun cotton, etc., may be considered as having equal strength, if a suitable detonator is used. Gunpowder requires at least four times as large a charge as does high explosive.

1201. Detonation.—Explosion is produced by detonation, for which purpose a small cap or detonator of fulminate is inserted in the charge,[1] called a **primer**. The charge of fulminate in commercial caps varies from 8 to 30 grains, according to size. Wet guncotton requires also a dry guncotton primer. Both cap and primer must be kept dry.

The cap may be fired by means of a powder fuse or by electricity. The latter is the preferred method, but requires a magneto-electric exploder and lead wires. If these are not available, the fulminate may be ignited by means of a powder fuse Two classes of fuse are employed, known as time and instantaneous. They are distinguished by the color of their wrappings, and by a frapping thread wound on the instantaneous fuse so that it may be distinguished by touch at night from the time fuse. Normally the color of the envelope of the time fuse is black; that of the instantaneous fuse, red.

Time fuse burns at the rate of about 3 feet per *minute;* instantaneous fuse, 120 feet per *second* or more. Caps and fuses must be kept away from other explosives.

The detonator is stuck in one end of a stick, and the ends of the wrapper tied around with twine. The leading wires (if used) are given a hitch around the stick to keep a strain from pulling out the detonator. The detonator should be located as near the center of the mass of the charge as convenient.

1202. Safety precautions.—Priming charges and detonators should not be put in before necessary, the firing connections should be made only after all is clear; and explosives should not be exposed to sparks or fire, or handled roughly. All safety precautions are merely these statements in various forms.

There are, however, a few things that may be added to the above, that one's caution would not of itself suggest. The principal of these is the behavior of dynamite in cold weather. Dynamite comes in sticks, usually paper covered. It is a mixture of nitroglycerine and "dope," sometimes inert, but more usually explosive. Sticks should be stowed horizontally to prevent exudation. In cold weather it freezes and gets hard. It has to be thawed to restore sensitiveness. This should be done either in a special hot water heater, or in a box packed with manure, and should not be hurried, for if overheated or roughly handled during this thawing process it is very sensitive. It may be frozen inside while soft on the outside. In working with dynamite and handling it, one gets a "nitroglycerine headache." Strong coffee or aspirin cures it.

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[1] Very powerful caps are required for T. N. T. to obtain proper detonation.

1203. **Charges should be tamped** in some manner whenever this is practicable, as their effect is thereby greatly increased. (With low explosive, tamping is essential.) Timbers should be bored to receive the charge if time and facilities permit. Charges placed to destroy concrete, steel, etc., should be tamped with earth or mud. It is the inertia of the tamping material that counts, and a plank with dirt on it laid over the explosive is quite effective. Earth tamping of a charge along the foot of a wall should be about 1½ times as thick as the wall for maximum effect. If tamping is impracticable the charge must be increased.

Skill in placing the charge will greatly increase its effect. Several small charges judiciously distributed will often produce better results than one large charge, but care must be taken to produce simultaneous detonation.

Reconnaissance.

1204. In the case of an important demolition a **reconnaissance or examination** should, if practicable, be made to determine the extent of the destruction required and the easiest, surest, and most expeditious manner of accomplishing it with the men and equipment available. The damage inflicted should be sufficient for the purpose in view and no more. Thus, **if the purpose is merely to delay** for a short period the use of a certain bridge, it may be sufficient to remove the deck instead of destroying the trusses. A telegraph line may be temporarily interrupted by cutting or grounding the wires, but for complete demolition further measures are necessary.

1205. **A structure that is to be demolished** should be attacked at **its weakest point**, or the point where the least time and effort in the way of demolition will require the greatest time and effort to repair the damage. Thus in the case of railroads, which are frequently attacked, it is easier to demolish a bridge than to tear up track; but is much more difficult to repair the damage to the track than to repair a small bridge. It is as easy to remove a rail on a curve as on a tangent, but it takes more time to prepare and place a curved rail.

Methods Employed.

1206. The following notes will indicate the methods employed in some of the important military demolitions.

(1) All **timber structures** may be destroyed by fire. For rapid work they may be sprinkled with coal oil, tar, or other inflammable liquid before ignition.

(2) **Framed structures** of wood or steel may be destroyed by attacking the weakest member of the framing. Thus in a truss bridge the chords may be cut at their thinnest points.

(3) **Bridges** are most effectively demolished by overthrowing their piers or abutments, which wrecks the entire structure. The most vulnerable points of roads and railroads are the important bridges or viaducts.

(4) **Railroads** may be attacked at culverts and tunnels. If these vulnerable points can not be reached, railroads may be interrupted by removing rails or cutting them with explosives, preferably on curves. A fire is made of the ties, the rails placed therein and twisted while hot. An entire section of track may be removed by opening the joints at each end, loosening the ballast and then overturning the section. This method may be executed quickly, takes considerable time to repair, and does not injure the track material. It is best to select an embankment and throw the loosened section down the slope. Railroads may also be crippled by removing or wrecking the rolling stock, especially locomotives, or by demolishing switches and water tanks. It is generally better to wreck the road at several points rather than to concentrate the work of destruction in one locality.

(5) **Highways** are very difficult to destroy, but the passage of vehicles may be interrupted by digging trenches across them, by firing land mines in the surface, or filling deep cuts with débris.

(6) **Buildings** may be demolished by closing all openings and firing a large charge in a central position.

(7) **Telegraph lines** may be interrupted by cutting the wires, but for complete demolition the poles should be cut down and burned, which also destroys the cross arms and insulators. At stations the instruments are removed or demolished, and the records seized.

(8) **Woods** are rendered useless for cover by burning, or by cutting down the trees with tools or explosives, then lopping off the branches and throwing them into ravines. The trunks may be left on the ground, and it is neither necessary nor practicable to remove the stumps, as it takes too much time.

(9) **Masonry arches** may be attacked by explosives at the haunches or crown. In a multiple arch bridge the destruction of a pier involves the two adjacent arches.

(10) **Locks** are rendered useless by destroying the gates or filling valves.

(11) **Supplies and materials** of all kinds are ordinarily destroyed by fire, after sprinkling them with inflammable liquids, or mixing inflammable and non-inflammable materials.

(12) **Obstacles placed in front of the trenches** are very difficult to destroy. They are often demolished by shells and grenades but such methods are slow, expensive, and unsatisfactory. Wire entanglements may be cut with nippers.

1207. The **proper charges of explosives** to accomplish certain results have been determined by experiment. The tables serve as a useful guide, but can not entirely take the place of experience and good sense. For detailed information see Engineers' Field Manual, U. S. Army.

Summary of Charges for Demolitions.

1208. The following table[1] gives approximate charges to be used for the different kinds of structures to be demolished. The formulæ apply for *dynamite*, *guncotton*, or similar *high explosive*. The charges are assumed to be *well placed, but untamped; if well tamped* the charges may be reduced one-third. When prepared in great haste in the presence of the enemy, *increase the charges one-half.* *Gun powder* requires charges four times as great, and *must be tamped*.

Object.	Pounds.	Remarks.
Hardwood trees, round (encircling charge).	$5\ T^3$..........	Also piles, masts, etc.
Hardwood beam, rectangular (encircling charge).	$3\ BT^2$........	B = longer side of cross-section.
Hardwood stockade or barrier (single charge).	$3\ BT^2$........	B = length of breach; T = maximum thickness of stockade.
Hardwood tree, round (auger-hole charge).	$\frac{3}{8}\ T^2$..........	T = Smallest diameter of tree; hole bored radially, so that center of charge shall be at center of tree.
Earth and wood stockade or barrier.	4 per foot.....	This is for breastworks 2 to 3 ft. thick, made of earth rammed between planks or railway sleepers.

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[1] Adapted from Military Explosives: Weaver. Published by John Wiley & Sons.

Object.	Pounds.	Remarks.
Brick and masonry revetments.	$\frac{1}{4}BT^2$........	Charge placed behind revetment against its back surface; for scarp walls of forts and surfaces of tunnels.
Detached masonry or brick wall (less than 2 ft. thick).	2 per foot....	Placed against the wall in close contact.
Detached masonry or brick wall (over 2 ft. thick).	$\frac{1}{2}BT^2$........	Placed against the wall in close contact.
Masonry piers of bridges........	$\frac{2}{3}BT^2$........	Placed against the pier in close contact.
Masonry arches of bridges........	$\frac{3}{4}BT^2$........	Placed along the crown of haunches.
Heavy gates....................	50 lbs.........	Gates of forts, armories, etc.
Iron rail stockade or barrier.....	7 per foot.....	This is made of iron rails, touching each other, placed in ground on end.
Iron plates, wrought or steel....	$\frac{3}{8}Bt^2$.........	t=thickness in inches. Laminated plates same as solid.
Steel rails.......................	$\frac{3}{8}$ lb...........	Lashed tightly to web of rail.
Field or siege-guns, medium caliber.	$1\frac{1}{2}$ lbs........	Placed on the chase near the muzzle.
Large seacoast guns.............	4 lbs.........	In bore tamped from the breech and muzzle with sand or earth.
Inflammable buildings or materials may be ignited.	1 disk of dry gun cotton.	Disk should be simply ignited, not detonated.

T=thickness in feet of object to which charge is applied.
t=thickness in inches of object to which charge is applied.
B=length in feet of breach to be made in object; if weight of charge per running foot is desired, make B=unity in formula.

Sec. IX.—CAMOUFLAGE.

General.

1209. Military camouflage is work done for the purpose of deceiving the enemy as to the existence, nature, or location of our troops, matériel, or military works.

The enemy may be deceived by:

(*a*) Making an object look like something else.

(*b*) Making an object indistinguishable from its surroundings.

(*c*) Suppressing all signs of human activity near the object, or deceiving the enemy as to the purpose of this activity.

(*d*) Erecting dummies.

1209a. The necessity for camouflage and the methods employed will vary widely with the situation. In stabilized warfare, the most minute precautions are necessary, while in open operations time will not be available either to the defense for taking such precautions nor to the offense for making the minute studies required, and the constantly shifting character of operations will greatly decrease the value of many of the precautions indispensable in position warfare. In open operations, camouflage against aerial photography falls off greatly in importance; the main effort should be directed to concealment from ground observation. The employment of dummy works designed to deceive the enemy as to the location of the more important works and centers of resistance is an especially effective form of camouflage in open warfare.

1210. When taking up positions in open warfare, natural and artificial cover (embankments, ditches, road cuts and fills, villages, woods, hedges, vegetation, etc.) are utilized to the fullest extent as means of concealment from observation.

1211. In stabilized warfare, the camouflage erected must be proof against the following means of observation:

(*a*) Air photographs taken either from directly overhead or obliquely. These are minutely studied by specialists trained to detect and interpret the faintest marks on the photographs.

(*b*) Direct observation from the ground, from captive balloons, or from low-flying airplanes. This is most important in order to prevent spotting of shots by enemy artillery observers.

The camouflage of an entire trench system or even of considerable lengths of trench is impracticable and should not be attempted. Effort should be directed toward camouflaging the more important works (e. g., machine-gun emplacements, dugouts, combat emplacements, etc.) with a view to concealing from the enemy the method by which the position is held.

1212. While there is some difference in the way in which a camera records a picture and the way in which the eye records it, it is usually safe to assume that perfect camouflage against air photographs will also be perfect camouflage against direct observation, excepting the close observation which is possible on works in or near the front line. In the latter case, greater attention must be paid to the choice of color so that the eye will be deceived, and to the placing of the camouflage so that observers on the ground can not see underneath.

1213. Before locating any military work which is to be camouflaged, a careful study of the air photographs of the locality should be made. When practicable the location of the work should be such as to make the camouflage as simple as possible. Subsequent photographs should be studied so as to correct the camouflage.

1214. Camouflage must be done well, as poor camouflage is usually worse than none at all.

Camouflage is a continuous process and must be constantly maintained. Frequent inspections must be made and injuries repaired. On account of the inflammable nature of much of the material used in camouflage work, it must be carefully protected against fire.

1215. Dummy works include dummy trenches, false entrances to shelters, trails, piles of excavated material, etc

Principles of Camouflage.

1216. The form of an object is its most dangerous element. Anything rectangular or regular in shape arrests attention. Nothing in nature appears regular, consequently anything that is regular must be the work of human hands. Regularity is manifested in two forms:

(*a*) In the shape of the camouflage and the shadow.

(*b*) In the regular spacing or alignment of similar works.

1217. The shape of the camouflage must not be such as to form a geometrical figure when viewed from a considerable distance. A line such as the edge of a saw may appear broken to close view, but perfectly straight from a short distance. In broken country, camouflage of fantastic shape readily escapes detection, and even in the open, fantastic shapes given to the solid parts of camouflage screens may stave off suspicion.

1218. A peculiar shape, which might escape notice if it occurs only once, will undoubtedly receive attention if repeated a few times at regular intervals. Regular spacing should, therefore, be carefully avoided.

1219. Shadows may reveal the existence and form of an object, and the problem of camouflage is to avoid such shadows. If the object can not be screened so as to eliminate the shadow, the latter should be made vague and indefinite. For this reason, camouflage screens are of irregular density, being thinned out near the edges.

1220. Texture is a quality which can be compared to the lay of the nap of cloth. It is determined by the amount of shadow of each separate element which makes up the surface. Texture causes tall grass to photograph dark, short grass lighter and flattened grass very light. This quality is difficult to estimate, but if incorrectly estimated, it will cause artificial material to contrast with its surroundings.

1221. Footprints made by men walking about in the vicinity of camouflaged works are the principal signs by means of which the enemy discovers the presence of the work. The reason for this is that the footprints photograph very light because of the fact that they have changed the natural texture of the surface. Every officer and soldier should be impressed with the fact that footprints about any piece of camouflage will certainly lead to its discovery. Carelessness in this respect is a serious breach of discipline and materially interferes with the success of military operations.

1222. Colors should be matched as closely as possible, but a slight difference in color between the camouflage material and its natural surroundings is not very noticeable. Objects viewed from directly or obliquely overhead may show a different color than when viewed from the ground. For example a field of young corn will appear green when viewed from the ground, because only the corn is seen, while from above, it will appear brown, because the earth between the cornstalks shows up prominently.

1223. Camouflage must be made to conform to changing seasons, principally by changing its color. Complete conformity can not always be attained, but by some repainting by introducing new patches of color and by the use of local materials, old camouflage can be kept up well enough to escape detection. When snow falls, camouflage which shows up must be covered with snow or with pieces of white cloth, painted with pale blue patches. Usually, only small sections need to be thus treated. Blast marks, trails, and roofs of dugouts must be especially watched.

1224. To avoid tracks:

(*a*) Use existing roads and paths wherever possible.

(*b*) Build new roads and paths under cover using natural cover as much as possible.

(*c*) Carry new roads and paths past the position to another road, a house, or a dummy position. Make sure that the road is used past the true position.

(*d*) Make the roads and paths follow existing lines, such as fences, hedges, ditches, edges of plowed fields, etc. Keep the roads narrow and avoid cutting corners.

(*e*) Hide the trail under a horizontal screen, 9 to 12 feet wide, with thinned edges, making use of hedges or similar lines.

(*f*) Confine traffic to one route. Keep this route narrow, and keep traffic on the route by the free use of trip wires.

1225. The principal camouflage materials are sod, shrubbery, branches, raffia on wire netting, painted canvas screens.

1226. Camouflage of machine guns must be kept as small as possible, and the spoil from the excavation must be disposed of so that it need not be camouflaged.

Forward machine guns are usually hidden behind plaster and burlap fronts, imitating earth or sandbag parapets, piles of stone, the face of a stone wall, etc., with a view to concealment from direct ground observation. The loophole should be covered by a hinged flap, which is opened only during firing.

Positions farther in rear are hidden by a light rectangular frame, covered with wire netting camouflage (grass or raffia), and capable either of moving up and down vertically, or hinged at the rear so that it will open like a trapdoor when the gun is to be fired. Small fish nets (10 feet by 10 feet) form a convenient and portable camouflage for machine guns. In favorable terrain, machine-gun positions may be disguised as piles of débris, road metal, broken timbers, etc.

1227. *Short lengths of trench* may be hidden by using painted scrim or cocoanut matting. The edges of the camouflage must be broken, and the camouflage covers must not be allowed to sag.

Wire entanglements, otherwise well concealed, are sometimes recognized by paths following the wire to a gap. The formation of such paths should be prevented by trip wires.

Permanent snipers' posts require a hole for observation, which is usually covered by gauze, and a hole for firing, which should be of an irregular shape and located in a natural shadow.

Snipers' heads are used in order to spot the location of enemy snipers. They should be fastened so that they can slide up and down in a fixed frame. When an enemy sniper shoots into one of these heads, the head is lowered, and the direction from which the shot came determined.

1228. Care should be taken to avoid betraying the location of the work by committing the following errors:

(*a*) A large amount of camouflage material has been prepared, but the work is begun before the camouflage is put in place.

(*b*) A work is well camouflaged; but depots of material are left unconcealed near by.

(*c*) A shelter is very carefully concealed, the excavated material is carried away at great pains, but a periscope is left unconcealed, or smoke issues from the interior, etc.

(*d*) A trail terminating at a command observation post is used for approaching the post.

(*e*) Men observe from the open near a post.

(*f*) Men do not keep concealed but move about when a hostile airplane is overhead.

and the men under them in the application of first-aid dressings, so that they can treat intelligently not only their own wounds but those of fallen comrades as well.

1234. **The measures for preventing wound infection** are extremely simple, yet their efficacy in saving life, in minimizing suffering, and in making complete recovery possible, is marvelous. For example, in 1870 the death rate from gunshot wounds of the knee joint was 75 per cent, and this meant many mutilating operations. To-day the death rate has been greatly reduced. In the recent fighting in France and Belgium many wounds were complicated by tetanus (lockjaw) owing to infection with germ-laden soil. The systematic use of serum injections has reduced the mortality in these cases.

1235. **Handling the wounded.**—Officers and men should be instructed in the proper methods of handling the wounded and in the various ways of improvising splints and litters.

1236. **The embarkation.**—Every ship's boat is supplied with a box containing emergency drugs and appliances with printed instructions for their use.

Sec. II.—THE RESUSCITATION OF THE APPARENTLY DROWNED.

1237. (1) Persons in distress in the water should try to throw themselves on their backs in order to float in that position, or should seek support from objects close at hand. As a rule, it is a mistake to try to swim to the shore.

(2) In approaching drowning persons, swimmers should get their attention and reassure them by calling in a loud voice that assistance is at hand. Approach a drowning person from behind, seize him by the hair if possible, and turn him on his back in front of you, while you yourself assume the same position in the water, keeping both heads a little above the surface by an occasional kick. As you swim up warn the victim that you will leave him if he grabs hold of you and does not obey directions.

Many people lose their lives in attempting to rescue others from not realizing the enormous power of a drowning person's frenzied clutch. If he succeeds in maintaining his strangle hold around your neck or in pinning your arms to your side you are lost. Try to tilt his head back to the point of submergence in the water. It may be necessary to administer a smart blow to stun him.

(3) Persons apparently drowned are suffering not only from the suffocating effects of water but usually from exhaustion caused by struggling and shock from fright and cold as well. They should be promptly and gently removed from the water and efforts at resuscitation should be begun instantly.

(4) If there are others present besides yourself send one man at once for help—to get a doctor and bring blankets, hot water-bottles, stretcher, etc. Keep some one to take turns with you in the laborious task of making the patient breathe.

1238. To remove water from the lungs.—Remove shirts; lay the patient on his face; clasp your hands under his abdomen and raise him in order to drain water from his lungs and air passages. (Fig. 83.)

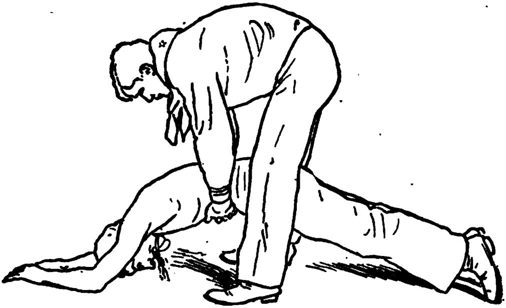

FIG. 83, ART. 1238.—To remove water from the lungs.

1239. To clear air passages.—Turn him on his back quickly, placing a rolled shirt under his shoulders, and thoroughly wipe out his mouth and nose. Pull his tongue well forward and tie it against the lower teeth by passing a shoestring or rubber band over it and under the chin, or hold it forward with a handkerchief secured by a pin stuck through the tongue. If ample help is available let some one hold it out or slowly draw it out and let it go back by rythmic movements.

1240. To restore breathing.—(1) First motion: Place the man on his belly, with his face turned to one side; kneel beside him and place the palms of the hands on the back of his chest along the lower ribs (fig. 84); lean forward and gradually bring the weight of the body on the hands, thus forcing the air out of the lungs. (Fig. 85.) *Avoid roughness.*

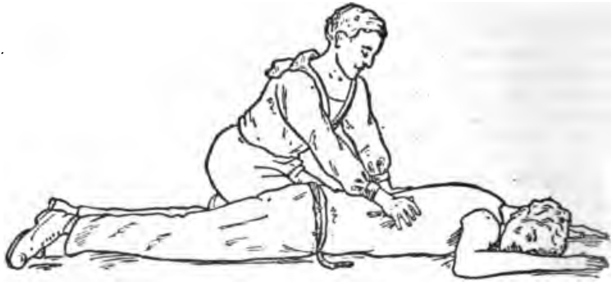

FIG. 84, ART. 1240 (1).—To restore breathing. First motion.

(2) Second motion: Release the pressure quickly and return to the original position. The first motion should occupy 2 or 3 seconds

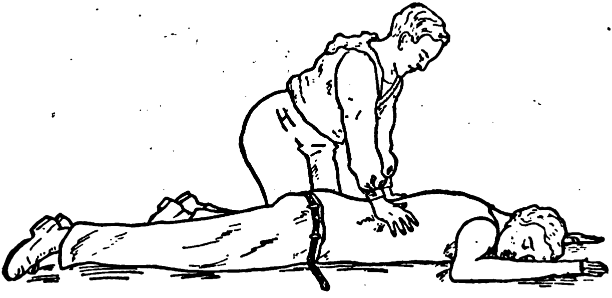

FIG. 85, ART. 1240 (2).—To restore breathing. Second part of first motion.

After returning to the original position there should be a wait o about 2 seconds before repeating; thus there will be about 12 respirations each minute. Imitation of natural breathing is the object

These efforts should be kept up for at least 2 hours, or until natural breathing is restored.

(3) All wet clothing should be removed while artificial respiration is being practiced, and the body and limbs should be rubbed toward the heart. Blankets should be wrapped about the patient and warmth in the shape of hot bottles, hot bricks, hot sand, or a hot board, that may have lain in the sun, should be applied.

(4) Do not give stimulants before the patient can swallow. Do not remove him until he is conscious and is breathing naturally.

Suffocation.

1241. **Suffocation** from foreign bodies in the windpipe, from hanging, and from the inhalation of poisonous gases, is treated by removing the cause, and by proceeding with artificial respiration as in the case of suffocation from drowning. A line should be made fast to a man before sending him down into an old well, or suspicious excavation, or into the presence of irrespirable gases.

Sec. III.—THE TREATMENT OF ACCIDENTS AND EMERGENCIES.

1242. **Foreign bodies in the eye.**—Foreign bodies in the eye usually lodge on the inner surface of the upper lid. If they can not be seen on the eyeball, tell the patient to look down, press a match, pencil, or the edge of a finger across the upper lid, half an inch above its edge, at the same time taking hold of the lashes and turning the lid up. (Fig. 86.) Remove the foreign body with the angle of a card or a twist of cotton on the end of a toothpick.

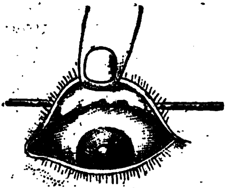

FIG. 86.—Method of turning up the upper lid.

1243. **Foreign bodies in the ear.**—Foreign bodies in the ear, including insects, are best removed by gentle syringing with warm water or by pouring warm water into the ear. Objects that swell in water should not be removed in this way. Rough manipulations about the ear are dangerous.

1244. **Bites and stings of insects.**—(1) Extract the sting, if possible; squeeze the part lightly, which will expel some of the poison. Pressure made with the barrel of a hollow key is excellent. Afterwards apply a little ammonia water, wet salt, or a slice of onion. Cold, wet applications may, if necessary, be applied afterwards.

(2) The stings of poisonous spiders, tarantulas, scorpions, and centipedes often make their victims very ill, but rarely are any of them fatal in their effects.

(3) Cut off the circulation with a string or tourniquet and suck the wound strongly until the part is freed of poison, then apply ammonia water and cold, wet applications.

Snake Bites.

1245. (1) The poisonous snakes of North America, except the coral snake, belong to the pit-viper family, which includes rattlesnakes, copperheads, and water moccasins. These snakes have a pit or depression between the eye and nostril, which readily identifies them. Their heads are heart shaped, bodies thick, and their teeth are arranged in two rows. Outside the teeth in the front part of the upper jaw are two fangs, one on each side. *Fangs are characteristic of poisonous snakes everywhere.* If the bite shows wounds from two rows of teeth and two fangs (Fig. 87), it is that of a poisonous snake. A single puncture usually means a fang prick.

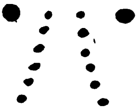

FIG. 87.

(2) The teeth of the nonpoisonous snakes are arranged in four rows, and the bitten part would show four rows of punctures (Fig. 88).

1246. Treatment.—(1) If possible, have the snake examined at once. Should it prove to be a nonpoisonous snake, then no treatment will be required.

(2) In every case of snake bite proceed as follows, unless the snake is known to be of a harmless type: Tie a strong ligature or two, a string or handkerchief, between the wound and the heart, wherever practicable; suck the fang punctures strongly, first cutting into each with a penknife a half inch deep and a half inch in length, if possible. Loosen the ligatures for a few seconds, at the end of a half hour, and from time to time afterwards, to prevent gangrene from stoppage of the circulation. Give alcoholic stimulants in small doses at frequent intervals, but never to excess.

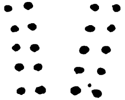

FIG. 88.

(3) Amputation and cauterization are not necessary. Strychnine, given with a free hand, is the best medicinal treatment; this should be employed only by a medical officer.

Effects of Heat.

1247. (1) **Burns** are caused by fire or dry heat.

(2) **Scalds** are caused by hot liquids or moist heat.

(3) There are three degrees of burns: First degree, a mere reddening of the skin; second degree, the formation of blisters (these two degrees of burns are not followed by scarring, and unless one-sixth of the body surface is involved recovery may be looked for); third degree, charring and destruction of the tissues. Both layers of the skin are burned and scarring always follows. These injuries are common in the naval service and are often of extreme gravity.

1248. Shock to the system.—This is in direct proportion to the superficial extent of the burn. Stimulants and quiet are the first essentials. If the shock—as shown by a cool, moist skin, shallow breathing, and weak pulse—is severe, it should be treated first and the local injury afterwards, when reaction has set in.

1249. The local injury.—Remove the clothing with the utmost care, seeing that no blisters are broken. It may be necessary to cut the clothing away, and if parts adhere they may be removed by soaking them in oil; if this is not sufficient, the part should be immersed in a bath of warm water. Only one part should be dressed at a time. In severe and extensive burns a greased bed sheet wrapped about the entire person makes an excellent temporary dressing.

1250. To dress burns proceed as follows: Apply over the burned parts pieces of lint soaked in a saturated solution of common washing soda (two heaping tablespoonfuls to a pint of water). Boracic acid ointment (10 per cent) spread on lint and applied to the burned parts makes a simple and excellent dressing. Strong antiseptics and powders should be avoided, and the dressings should not be changed too often. Normal salt solution, made by dissolving a teaspoonful of common table salt in a pint of water, bringing it to a boil, and then cooling it, is the only solution that should be used in cleansing burns and bathing wounds in general. The best of all dressings for burns is some form of melted hot paraffin. That used to keep pots of mucilage from drying or what housekeepers put over jelly glasses will do. Apply on top of the paraffin after cooling a thin layer of absorbent cotton or a bandage.

1251. Burns from acids.—First flush the parts with water, wash them with a saturated solution of common washing soda, and then treat as for an ordinary burn.

1252. Burns with alkalies.—Flush the parts with water, then wash with a dilute mixture of vinegar and water, one part in four, and finally treat as for an ordinary burn.

1253. To extinguish the flames from burning clothing.—Throw down the person whose clothes are on fire, and cover him up as quickly as possible with a coat, blanket, rug, or anything at hand that will smother the flames. The impulse to escape is irresistible. To render garments noninflammable soak them in a solution of ammonium phosphate, 2 pounds to the gallon.

1254. Sunburn.—Sunburn should be treated in the same manner as other burns. Limewater, with the addition of 2 drops of liquid carbolic acid to the ounce, is a very soothing application..

Sunstroke.

1255. Sunstroke begins with headache, dizziness, redness of the eyeballs, and dryness of the skin. Persons in this condition should immediately apply for treatment. The face soon becomes congested—red or purplish—and if the symptoms are not checked the patient becomes unconscious, with heavy, labored breathing, a hot, dry skin with engorged blood vessels, and finally has convulsions. In sunstroke the pulse is rapid, full, and strong.

1256. Treatment.—Lowering the temperature is the primary object in these cases. Transport the patient to a cool, airy, shaded spot, and remove as much clothing as possible. Pour cold water, or ice water, over the head and body, or ice may be rubbed over the chest and placed in the armpits. If at hand, a cold bath should be given. After a while consciousness will return; the application of cold water may then be discontinued, to be resumed only in case consciousness is again lost. These cases are most serious in character and should be treated promptly and actively. If there is no ice at hand, cool water and fanning must be employed.

Heat Exhaustion.

1257. This is a condition of great depression of the system due to the action of heat. The skin is cool and moist, and the patient is more or less collapsed, but generally responds well to treatment.

The pulse is feeble and fluttering, perhaps imperceptible, and the whole picture is one of weakness and exhaustion.

1258. Treatment.—Give a teaspoonful of aromatic spirits of ammonia in a third of a tumbler of water. Small doses of whisky or brandy, well diluted, may be given. Remove the patient to a cool, shady place; bathe his face, hands, and wrists, and keep him on his back until he recovers. Loosen all tight clothing.

Effects of Cold.

1259. Frostbite most often involves the toes; still the fingers, ears, and nose are frequently frozen.

1260. In the trench warfare in Europe so-called frost-bite was the result of prolonged soaking in cold water, while at the same time the circulation of blood is interfered with by the constriction of tight shoes, boots, or puttees.

The object in view in treating frostbite is to restore slowly and gradually the warmth and the circulation of blood in the part affected. If the case is mild and some reaction from the extreme cold has begun, rub the part lightly and apply cloths wrung out in cool or tepid water. If the part is still dead and cold, combine the rubbing with the use of snow or ice water and as life returns use water not so cold. The rubbing must not be too energetic, as any roughness or bruising will increase the damage. Prolonged soaking in ice water simply keeps up the original cause of the injury. The change from cold to natural warmth is called *reaction* and may occur of itself. If brought on too quickly or if it does not come at all, gangrene results. This is indicated by the skin turning dark and blistering or scaling off. When there is gangrene do not use friction, but protect the part with warm melted paraffin, or boric acid powder, 1 part, made into an ointment with vaseline, 9 parts. Surround with thick absorbent cotton and apply heat. Avoid bandaging with a roller bandage for fear of making undue pressure. Keep dressing in place with a cloth, neckerchief, or triangular bandage and safety pins.

In the case of a person apparently dead from exposure to cold, rub the body and limbs vigorously, apply heat externally, and do artificial respiration. When circulation is restored (patient becomes conscious, color returns, heart beat and breathing reappear), give hot drinks at intervals of 10 or 15 minutes—hot coffee or tea and aromatic spirits of ammonia. Efforts to restore animation should be continued for an hour or two unless a medical officer pronounces the case hopeless.

Freezing.

1261. If the whole body has been long exposed to extreme cold, there will follow a depression of vitality which requires most cautious treatment.

1262. Treatment.—(1) Restore bodily warmth by surrounding the patient with heated blankets or by exposing him before an open fire. It is safe to bring him into a moderately warm room. If a bath can be given, immerse the patient in warm water, and gradually increase the temperature until it is as hot as it can be borne.

(2) Stimulants, such as hot tea or coffee, in moderate quantity, may be given internally, with the addition of small quantities of spirits.

Shock by Electricity.

1263. Persons taking hold of naked live wires, with a current of high tension passing through them, would be violently convulsed and be unable to let go, or there might be insensibility with suspended animation, or even death. Parts of the body or clothes in contact with the wires may be scorched or burned.

1264. Treatment.—(1) Promptly remove the sufferer from the source of danger. This must be done with the greatest care, otherwise the person giving assistance may be dangerously shocked. The rescuer's hands should be protected with rubber gloves; if these can not be procured, first wrap a mackintosh coat, or a thick, dry, woolen-cloth coat, or other *dry* article of clothing, around the patient and then pull him away from the source of danger. Two live wires in contact with the patient may be short circuited by *dropping* an iron bar or a metallic tool across them.

(2) The patient should be laid in a quiet place, his clothing should be loosened, and he should have plenty of fresh air. Medicines are not required. If breathing is suspended or feeble, artificial respiration may be set up in the manner described in article 1240. The mouth will not have to be cleared as in drowning accidents, but care must be taken that the tongue does not fall back, so that its base will close the breathing passages.

1265. Lightning stroke.—Lightning stroke is much the same as electricity in its effects and the treatment is the same.

Unconsciousness or Insensibility.

1266. Unconsciousness may be due to diseases of the brain, to diseases of the heart, to general diseases, to injuries of the head, and to poisons of various sorts.

1267. Treatment of unconsciousness.—The treatment suitable for all cases in which there is doubt as to the cause of unconsciousness is to secure quiet and rest, the body being laid upon the back with the head a little raised. If there is great paleness and a cold surface, with slow, sighing breathing (signs of prostration), smelling salts, or a few drops of ammonia on a cloth, may be held under the nose, and hot tea or coffee may be given while heat is applied to the body. If there is great heat of the surface, cold may be applied to the head and body and cold drinks may be given. If the patient is fully unconscious, drinks should not be administered, as the fluid is apt to get into the windpipe, which would cause the patient to cough violently.

1268. Fainting.—(1) A fainting person should be laid out flat at once. The head should be as low as, or lower than the body in order to get blood to the brain. Tight clothing should be loosened. Ammonia held under the nose will sometimes act promptly. After a fainting fit, give half a teaspoonful of aromatic spirits of ammonia in a tablespoonful of water. A little alcoholic stimulant in hot water may be useful. It is dangerous to keep a fainting person in an upright position

(2) In a crowded room, fainting may be prevented by placing the patient in a stooping position, with his head between his knees and at a lower level than his hips. This will usually ward off an attack, but this plan must not be employed if the patient has fainted completely.

Epileptic Fits.

1269. The patient falls with a cry, his face is livid, he has convulsions, and foams at the mouth. His tongue and lips are often bitten.

1270. Treatment.—Gently lay the patient on his back and control only those movements calculated to injure him; do not struggle against such movements as will do no injury. To prevent the lips and tongue from being bitten, put a folded towel, or a bit of soft wood, or a cork with the string attached between the teeth. The fit usually lasts but a few minutes, after which the patient falls into a deep sleep, and should not be disturbed.

The Treatment of Poisoning by Unknown Poisons and Poisonous Foods.

1271. (1) **If treated promptly** cases of accidental poisoning are rarely fatal. Proceed as follows: If possible give a large quantity of lukewarm water and tickle the back of the throat with a finger or a feather. A tablespoon of common powdered mustard in a tumbler of warm water is an excellent emetic. Two tablespoonfuls of common table salt in a tumbler of warm water is also an excellent emetic. These emetics may be repeated once or twice. Soapsuds or dishwater may be drunk. Soap is an antidote for many poisons. The patient must be forced to drink a large quantity of fluid, and be made to vomit several times, though not pushing this to exhaustion. After copious vomiting, soothing liquids should be given, such as oil, milk, beaten-up raw eggs, or flour and water—each in moderate quantities. These are valuable when the poison has been of an irritating character.

(2) If the patient is in collapse, give stimulants, such as strong hot tea, without milk, as it is a chemical antidote for many poisons. Coffee is next in value. Alcoholic stimulants in teaspoonful doses in hot water should be given as well. The patient should be covered with warm blankets; and hot bottles, or hot bricks, properly protected, should be applied next to his body.

1272. Acid poisoning.—In acid poisoning give alkalies, such as a tablespoonful of aromatic spirits of ammonia in two teacupfuls of water, or baking soda, whitewash, chalk, tooth powder, whiting, plaster from the wall, or soap.

1273. Alkaline poisoning.—(1) In alkaline poisoning, vinegar can generally be had, and there is nothing better. It should be given undiluted and freely—a half teacupful at a time. Lemon juice may be used.

(2) After the antidote has been given in cases of poisoning, either by acids or alkalies, milk, oil, or beaten eggs should be administered and rest should be secured.

1274. Wood-alcohol poisoning.—(1) Wood alcohol, which is one of the most dangerous poisons known, has caused many deaths in the naval service, and has induced total and permanent blindness in many of those who have escaped death. The men should be taught that the penalty for drinking wood alcohol may be either permanent total blindness, or death. Wood-alcohol receptacles should be labeled so that the danger will be made known to those likely to drink of their contents, and the alcohol should be made undrinkable by the addition of a small percentage of naphthalin.

(2) *The symptoms* are great abdominal distress, vomiting, pronounced depression, unconsciousness, and death. If recovery does occur, blindness is likely to follow in a few hours.

(3) **Treatment.**—The treatment should be the same as that given for poisons in general. If a medical officer is within call, the stomach and rectum should be washed out immediately.

1275. In all cases of poisoning the patient should be urged to pass urine.

Sprains.

1276. (1) A sprain is the straining or tearing, by a sudden twist or wrench, of the ligaments and capsule which surround a joint.

(2) **Signs.**—Pain, heat, and swelling at the seat of injury, followed by discoloration of the skin. The ankle, knee, and elbow are the joints most commonly sprained. The bones about the wrist joint are very commonly broken, but the joint is rarely sprained.

1277. Treatment.—Put the damaged parts at complete rest by elevation and support on a pillow or pad and apply cold applications. If the pain is severe and cold applications can not be tolerated, bathe the joint with water as hot as can be borne comfortably, or apply hot flaxseed poultices. A snug bandage should be applied afterward. Later on the joint should be strapped with rubber plaster, which should be applied by a medical officer. Massage should be employed in many cases. When the sprain involves a joint of the upper extremity, the forearm should be supported by a sling, after the joint has been treated. A light padded splint should be applied behind the knee, when that joint is injured; the patient should use crutches, if he moves about at all, in cases of sprains of the ankle and knee joints.

1278. The patient's care of himself.—(1) Follow directions faithfully. Too early use of a sprained joint induces weakness of that joint and a tendency to a recurrence of the sprain.

(2) An injured joint should be kept slightly elevated by placing it on a pillow or other support.

Dislocations.

1279. (1) A dislocation is the displacement of the end of a bone which enters into the formation of a joint.

(2) **Signs.**—Dislocated bones usually lie away from the body, and can not be brought to the side so as to parallel the long axis of the body. There is distortion of the joint; the end of the bone can be felt under the skin, and by comparing with the uninjured side it will be recognized as out of its normal position. There is pain on attempting to move the bone and loss of motion in the joint.

1280. Treatment.—The risk of doing injury by injudicious efforts to replace a dislocated bone is greater than that of delaying until the services of a medical officer can be had. The best that can be done is to put the parts in the position easiest to the patient, and to surround the joint with cool, wet cloths, or with cotton and a bandage.

1281. The patient's care of himself.—He should keep as quiet as possible until the dislocated bone has been replaced, and should steady the injured part by taking hold of it. He should lie down if the injury has made him feel faint.

Fractures.

1282. (1) A fracture is a broken bone.

(2) **Causes.**—*Direct violence,* by means of which the bone is broken at the seat of injury. *Indirect violence,* by means of which the bone is broken at some distance from the point which received the blow or shock, as a broken collar bone following a fall upon the outstretched hand. *Muscular action,* snapping a bone across by a sudden and violent muscular contraction, as in the case of the kneecap in jumping.

1283. Signs of fracture.—These are pain, swelling, and deformity at the seat of injury. Unnatural mobility where no mobility should exist. Loss of power in the limb. The limb can be pulled into line with the long axis of the body without difficulty. There is shortening of the limb. Crepitus, which is a sensation of grating, can be felt when the ends of the bones move against each other.

1284. Varieties.—There are two general varieties of fractures—1, simple; 2, compound.

(1) *Simple fractures* are those which are beneath the unbroken skin.

(2) *Compound fractures* are those in which an external wound, communicating with the break, exists.

1285. Treatment.—In the immediate treatment of a fracture the following points should be attended to: (1) The prevention of further injury, and (2) the preparation of the patient for transport.

1286. To prevent further injury.—(1) Attend to the patient on the spot where the injury occurred, especially if the fracture happens to be in the lower extremity.

(2) Do not touch the limb (beyond what is necessary for diagnosis) until you have all splints and bandages ready.

(3) Handle the injured part with extreme gentleness. By rough handling a simple fracture may be converted into a compound or

complicated one, especially where the bones are immediately under the skin, like the collar bone and the shin bone.

(4) Without removing the clothes (unless the fracture is compound or there is hemorrhage) bring the bones into their relative positions as follows: First lift the limb by grasping it gently but firmly above and below the seat of fracture, and then make gentle extension and counter extension in the normal line of the bone, which should cause little or no pain if done properly.

(5) Fix the limb in this position by means of splints and bandages.

1287. Splints.—Splints are more or less rigid supports used to immobilize joints and fractured bones. Many articles in daily use, and others that can be found in the field, can be used to keep the injured parts in place. For instance, broom handles, newspapers, wine-bottle covers, stockings filled with straw or sand, pieces of wood and laths can be employed. In the field we may make use of the branches of trees, pieces of bark, shrubs, rifles, and bayonets. The opposite leg can be used as a splint for the injured one, and in case of the upper extremity it can be splinted against the chest by snugly binding it there with bandages.

1288. Improvised splints.—These splints should always be constructed out of material which is sufficiently stiff to keep the parts in position; they should be made long enough to extend some distance beyond the joint below the point of fracture, and beyond the joint above it, if possible. They should be as wide as the limb to which they are to be applied. Before applying splints, pad them well, on the side next to the limb (unless the clothing is allowed to remain on), with some soft material, such as towels, cotton, wool, oakum, straw, flannel, folded triangular bandages, etc., and make the padding extend well over on each side of the splint.

1289. To apply splints.—Two persons are required: One makes traction, and gently lifts the injured part while pulling steadily in the line of the injured bone. This can sometimes be done with one hand. In that case the other hand should be put under the seat of fracture to support it. The second person applies the splints, one on each side of the limb, and fixes them in position by tying about them, above and below the line of fracture, triangular bandages, folded narrow, or straps, belts, suspenders, tapes, or rubber-plaster. All knots should be tied over the outer splint and not over the bone. The general rule that injured parts should be elevated holds good in the case of fractures. The splints should not be applied so tightly as to impede the circulation. If splinted limbs are allowed to hang down, swelling follows and the circulation may be dangerously cut off.

1290. The immediate treatment of a compound fracture.—Expose the wound, check the hemorrhage (arts. 1304 to 1311), and apply the first-aid dressing (art. 1314). Then apply splints. The principal danger in these cases is wound-poisoning. The commonest source of poisonous bacteria, or germs, is the skin of the fingers, or the skin about the wound. Do not touch the wound with unclean fingers, unless necessary to stop bleeding to save life.

1291. Transportation.—As a rule, persons with broken bones should not be removed until the bones have been splinted. Faintness is apt to come on after a fracture, but usually persons suffering from fractures of the upper extremity can walk with assistance. Those suffering from fractures of the lower extremity should be carried on a stretcher, and this should be done in accordance with the instructions laid down in articles 1316 and 1317.

1292. The injured person's care of himself.—Should the patient believe he has sustained a fracture, he should lie down carefully, and should try to place the broken bone in its proper position, which will be found to be the most comfortable one. Under no circumstances should he attempt to walk if a lower extremity has been injured, as in this way a simple fracture might be made compound, or the bone ends might be made to tear into a large blood vessel.

Special Fractures.

1293. Fracture of the skull.—These injuries are very serious and should be treated by a medical officer as early as possible. Wound-poisoning should be prevented by applying a dressing as directed in article 1301.

1294. Fracture of the jaw.—Tie a triangular bandage, or handkerchief, under the chin and over the top of the head.

1295. Fracture of the ribs.—Pass a wide band of rubber-plaster or several narrow bands two-thirds around the chest while the arms are held over the head and the chest is emptied of air; or snugly apply wide bandages.

1296. Fracture of the collar bone.—Apply a sling (fig. 89), and secure the arm to the chest by passing a bandage around the chest above the forearm of the injured side, *over* the arm of that side, and *under* the opposite arm.

1297. Fractures of the arm and forearm.—The proper method of dressing a fracture of the forearm is shown in figure 90. The part should be carried in a wide sling. Figure 91 shows the proper method of dressing a broken upper arm. It will be noticed that the sling does not support the elbow.

1298. Fracture of the leg.—An ordinary pillow tied about a broken leg makes an excellent splint (fig. 92). Splints should be applied as shown in figure 93.

1299. Fractures of the thigh.—(1) A broken thigh is the most difficult bone in the body to splint properly. The splint on the outside should extend from the armpit beyond the sole of the foot and that on the inside from the crotch to the sole of the foot. The splints should be applied as shown in Figure 94.

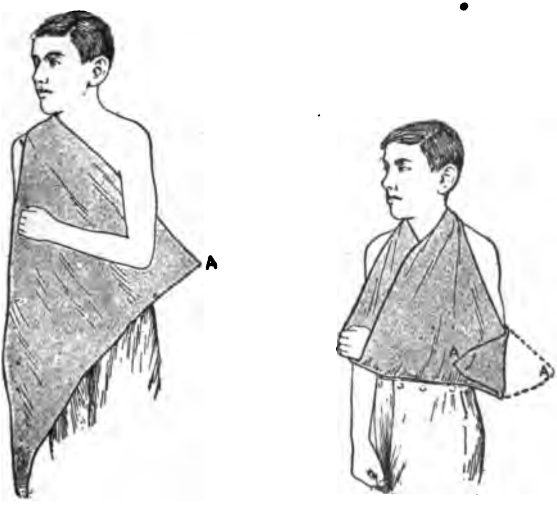

FIG. 89—Method of applying a sling for the support of the forearm.

(2) In the field a rifle may be used instead of the long outside splint. The butt is placed in the armpit, the trigger guard to the

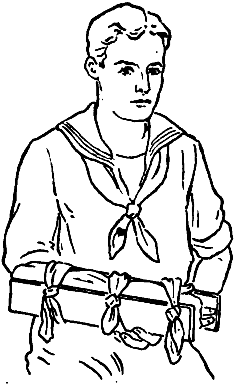

FIG. 90.

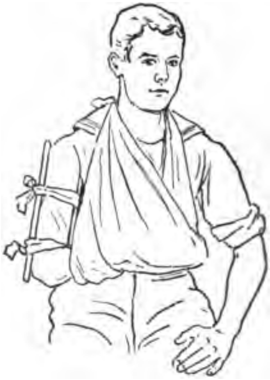

FIG. 91.

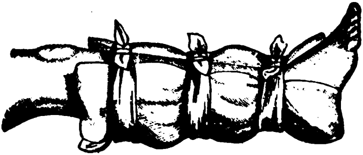

FIG. 92.—A pillow used as a temporary splint in fracture of the leg.

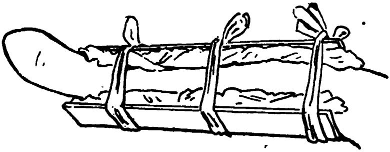

FIG. 93.

front. It should be secured at the points shown in Figure 94. The feet should be tied together, also the legs below the knee. This prevents the foot on the injured side from turning out.

Sec. IV.—WOUNDS IN GENERAL.

1300. (1) **The immediate treatment** of wounds in general is extremely simple. As a rule, if the wounded part is freed of constricting clothing between the heart and the wound, and is elevated or held up, bleeding soon ceases. Of course, whenever it is possible to secure the services of a medical officer, all wounds should be promptly referred to him for treatment, as important nerves, tendons, and other structures might be damaged, thus seriously crippling the part afterwards.

(2) *If a wound is kept free from infection*, which means poisoning by germs, it will, as a rule, heal promptly, painlessly, and with little scarring. The common scources of infection are the skin of the hand, the skin about the wound, the hair, soiled dressings, and foreign bodies, like bits of clothing carried into the wound.

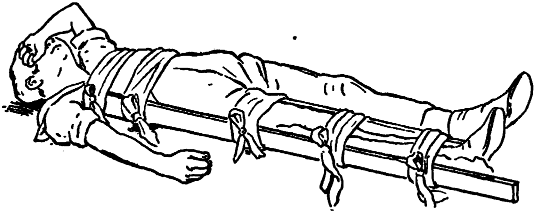

FIG. 94.

1301. To dress a wound.—(1) Scrub the hands vigorously for 4 or 5 minutes with a brush and some good soap, paying particular attention to the nails, and rinse them in boiled water. They may, if it is at hand, be soaked for a few minutes in a solution of bichloride of mercury, 1 part in 2,000 parts, or in a solution of carbolic acid, 1 part in 40, and again rinsed in boiled water. The skin about the wound should be shaved for 2 or 3 inches and scrubbed in the same way, and finally washed off with boiled, common salt solution. The salt solution is prepared by dissolving a teaspoonful of common table salt in a pint of clear water and boiling for a few moments.

(2) This solution will answer for wounds in any part of the body and is the best one that can be employed. It is harmless, soothing, healing, and cleansing, and can be freely applied to such delicate parts as the eye, nose, and throat.

(3) The wound should be freely washed out with the salt solution and foreign bodies, like bits of wood, bits of clothing, and dirt removed.

(4) If the wound is clean-cut, the edges should be brought together and held there by the dressings, if possible. If the wound is jagged, irregular, and bruised, lay plenty of loose gauze into it, and over it, and apply cotton and a supporting bandage outside.

(5) All instruments should be boiled; all dressings should be baked in an oven, just short of charring, unless they are known to be free from germs. Boiling them also kills all contaminating germs that may lodge on them.

(6) Bad smelling powders and all other applications of that sort are unnecessary in fresh wounds.

1302. Inflamed parts with unbroken skin.—Remove tight clothing, elevate the part and apply plain cotton and a bandage from below to a point above the inflamed part. If pus (matter) is present it should be let out.

1303. Inflamed wounds forming pus.—Elevate the part, arrange the dressing so that the pus can flow away, and is not dammed up. Cloths wet in ice water, or cool, boiled water, should be laid upon the part. When the inflammation has subsided apply a simple dressing consisting of gauze, cotton, and a bandage.

The Checking of Hemorrhage.

1304. (1) Though 85 per cent of the deaths on a battle field are due to hemorrhage, the danger from hemorrhage, when not immediately fatal, has been greatly exaggerated.

(2) Those whose injuries involve the great blood vessels will probably die immediately, unless some comrade checks the flow of blood by pressure made with the fingers, until the services of a medical officer can be secured.

(3) When properly applied, the tourniquet may be a useful instrument; ordinarily, it is a very dangerous one. It should not be used unless you have good reason to believe that a large artery has been cut. Try first to stop the bleeding by pressure at the bleeding spot—a very firm pressure with a compress, finger, or entire hand. At the same time make pressure on the vessel higher up on the limb

with your hand. Reassure the patient. Keep him quiet and lying down. If there is no fracture elevate the bleeding part. The tourniquet should not remain on longer than two hours, lest gangrene be induced. If not properly adjusted it will increase the flow of blood by failing to cut off the circulation in the arteries (which are deeply embedded in the flesh) while the blood is backed up in the veins (many of which are near the surface, just under the skin.)

The rubber tourniquet is put on the stretch behind the limb and then the ends are secured by a reef knot. After it has been on 15 or 20 minutes loosen it a little. This will permit circulation of blood to other parts. If the hemorrhage begins again, tighten up again on the tourniquet. By carefully and gently loosening the constriction in this way very little additional blood is lost and there is much less danger of gangrene later.

(4) In order to control external hemorrhage satisfactorily, it is necessary to know the location of but four great blood vessels. In figure 95, the numbered arrows designate the important vessels. Arrow No. 1 points to the carotid artery, which supplies the head with blood. No. 2 points to the subclavian artery, behind the middle of the collar bone. This blood vessel continues into the arm and finally becomes the brachial artery, designated by arrow No. 3, which supplies the arm,

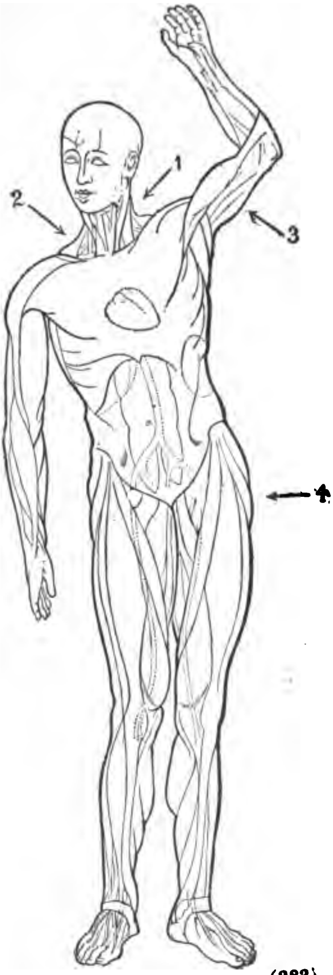

FIG. 95.

hand, and forearm. Arrow No. 4 points to the femoral artery, which supplies the foot, leg, and thigh.

(5) Officers and men should study the pulsation of these vessels in their own persons, in order to become familiar with their location, and to determine the amount of pressure necessary to arrest the flow of blood.

(6) By putting a pad behind the knee and bending the knee sharply on the pad, all circulation will be stopped in the foot and leg. The same is true of the elbow. (Figs. 96 and 97.)

1305. Tourniquets.—The best field tourniquet is an elastic rubber tube. This should be bound tightly about a limb and its ends secured by tying.

1306. The "Spanish windlass" is the best of the improvised tourniquets (fig. 98). If possible, put a pad, a smooth stone, or a folded handkerchief, over the blood-vessel to be compressed. The stick, or bayonet, can be secured to the limb by a band of some sort to prevent it from unwinding.

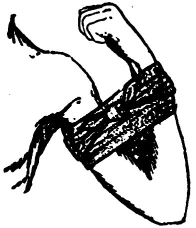

FIG. 96.

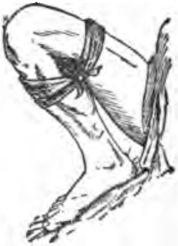

FIG. 97.

1307. How to proceed in a case of severe hemorrage.—When the blood spurts in jets, or flows very freely, press the great vessels supplying the part (fig. 95), against the bone beneath and, with the assistance of the wounded man, apply a "Spanish windlass" as soon as possible. Finger pressure can not be kept up longer than a quarter of an hour. In order to save life it may be necessary in rare cases to put the fingers or thumb directly into the wound in order to compress the bleeding vessel therein. *Under no other circumstances should an unclean finger come into direct contact with the wound.* If practicable, compress the vessel in the wound *through* a first-aid dressing. The part should, if possible, be elevated and have all constrictions between the heart and the wound removed.

1308. The wounded person's care of himself.—(1) Apply the first-aid dressing, and compress the bleeding vessels in the wound through this dressing. Elevate the part, loosen constrictions, and apply a "Spanish windlass." Lie down and remain quiet. If the bleeding is profuse, press the great vessel supplying the part against the bone and apply a "Spanish windlass," made with a neckerchief, or a triangular bandage, and tightened with a stick or bayonet (fig. 98).

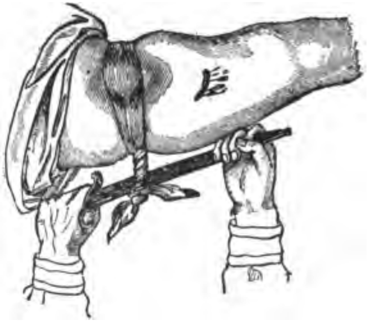

FIG. 98.

(2) Pressure may be applied in the following regions to check the flow of blood:

1309. Scalp wounds bleed profusely, as a rule. Apply a first-aid dressing and bind it firmly against the skull, and make further pressure on the dressing if necessary.

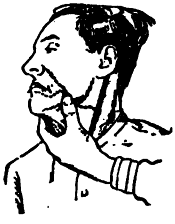

FIG. 99.—Compression of the facial artery.

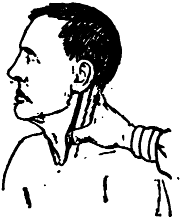

FIG. 100.—Compression of the cartoid artery.

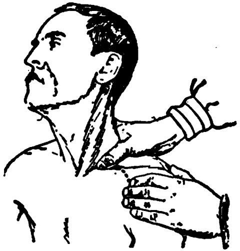

FIG. 101.

1310. Figures 99 to 106, inclusive show where and how the blood-vessels in the different parts of the body should be compressed. The great advantage of compression with the fingers is that it can be applied immediately and may thus be the means of saving life.

1311. Internal hemorrhages.—These hemorrhages are apt to be very grave complications. In wounds of the chest and abdomen, complicated by dangerous internal bleeding, firm, circular compression over the first-aid dressings should be made. The cartridge belt, or gun strap, can be used to limit the movements of the chest and abdomen and thus secure a condition of rest for the bleeding organs, as near as can be done by external means.

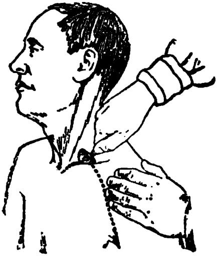

FIG. 102.—Compression of the subclavian artery with the padded handle of a door key.

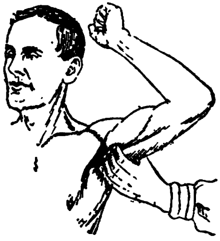

FIG. 103.

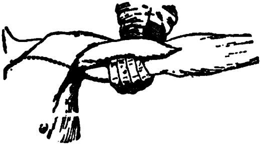

FIG. 104.

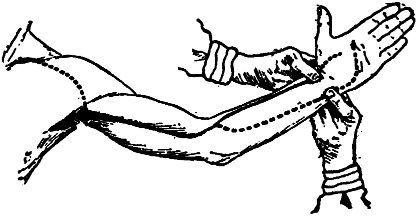

FIG. 105.

Sec. V.—THE APPLICATION OF FIRST-AID DRESSINGS IN GUNSHOT WOUNDS.

1312. (1) **The first-aid packet** contains two compresses made of folds of gauze, one gauze bandage, two safety pins, and a triangular bandage. Printed explanations on the triangular bandage show the various uses to which it can be put.

(2) **The dressings** are wrapped in a water-proof cover and are served out clean and germ free. The men should be made to appreciate the value of this life-saving device, and should be held responsible for its safe-keeping.

(3) **The two compresses,** or folds of gauze, are for the two wounds, that of entrance and that of exit. The bandage holds the compresses in place, and is secured with the safety pins. In some types of first-aid packages, the compresses and bandage are all in one piece, which simplifies the application of the dressing.

(4) By frequent drills alone can skill in the application of these dressings be acquired.

1313. On board ship, large or shell wound dressings are prepared for use with wounds larger than the ordinary bullet wound. They are supplied to turrets' and guns' crews. They are backed by muslin and have four tails for securing around the body. The muslin goes outside and the gauze next to the wound. Open the package and apply without touching the white, sterile gauze with your fingers.

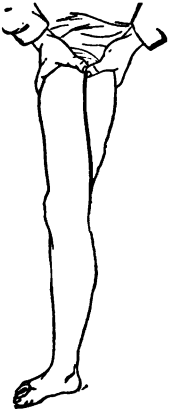

FIG. 106.

How to Apply a First-Aid Dressing to a Gunshot Wound.

1314. The immediate treatment of gunshot wounds differs in some particulars from the treatment of wounds in general.

(1) Under no circumstances attempt to disinfect or wash the wound.

(2) The wound is not to be touched with the fingers. Avoid handling that part of the dressing which will come into contact with the wound. The danger of infection from unclean fingers is very great, and is more serious in its effects, as a rule, than the destructive action of the bullet.

(3) The dressing should be applied to the wound without cleansing it, but just as it is found, and great care must be taken to see that the compresses do not slip to one side and expose the wound to germ poisoning.

(4) In dressing wounds of the hairy scalp, part the hair, without touching the wound, before the compress.

(5) If the injured part can be readily exposed, it should be done. If the contrary is the case, then the clothing should be slit up with a knife.

(6) The majority of these wounds heal under a single dressing. The men should be made to understand this, as they are usually impatient to have their wounds dressed frequently.

(7) Under no circumstances are dried blood crusts and scabs to be disturbed.

(8) In case of hemorrhage, proceed in accordance with instructions in article 1307.

(9) In case some of the bones have been damaged, proceed as directed in articles 1280 to 1290.

1315. The wounded person's care of himself.—After the checking of dangerous hemorrhage, the prevention of germ-poisoning is of the greatest importance. Carefully get out the first-aid packet, seeing that none of its contents is dropped on the ground, and that the fingers do not touch the part of the compress likely to lie in contact with the wound. Do not disturb crusted blood on the dressings near the wounds. If the wound is out of reach and can not be dressed at once it should be left exposed to the air until assistance comes. If there is little pain, no throbbing, and no fever, be contented, for the wound is doing well and will probably heal under a single dressing. Be patient in waiting for dressings and treatment, as the medical officers will be overwhelmed with work after a battle, and those most seriously injured and most urgently in need of attention must be treated first.

1316. The preparation of the wounded for transportation.—The first-aid dressings should be applied (Art. 1314), and broken bones should be immobilized with splints (Arts. 1289 and 1290), when the wounded will be ready for transportation. Figures 107–110 show the methods of carrying the wounded with one, two, and three bearers. Patients can sometimes be carried "pick-a-back." The "fore-and-aft" carry is effected by two bearers, one between the knees, the other behind the head, arms under the armpits of the patient with hands clasped over his chest.

General Directions for Handling a Stretcher.

1317. (1) The method of placing a wounded man on a stretcher is shown in Figure 111. The position of a patient on a stretcher depends upon the character of the injury. An overcoat, blanket, knapsack, or other suitable article may be used as a pillow. If the patient is faint the head should be kept low. Difficulty in breathing due to wounds of the chest is sometimes relieved by judicious elevation of the shoulders. In wounds of the abdomen the best position is on the injured side, or on the back if the front of the abdomen is wounded, the legs being drawn up and supported in that position.

(2) In injuries of the upper extremity, the best position is on the back with the arm across the body, or suitably placed by its side. In injuries of the lower extremity the patient should be on his back, or inclining toward the wounded side. Patients should be handled deliberately and as gently as possible, having special care not to jar the injured part. Bearers should not keep step. The handles of the stretcher should be carried at arms length. Bearers should keep the stretcher level, notwithstanding any unevenness of the ground. As a rule, the patient should be carried on a stretcher feet foremost, but in going up a hill his head should be in front. In case of fracture of the lower extremities, he should be carried up a hill feet foremost and down hill head foremost, to prevent the weight of the body from pressing down on the injured part.

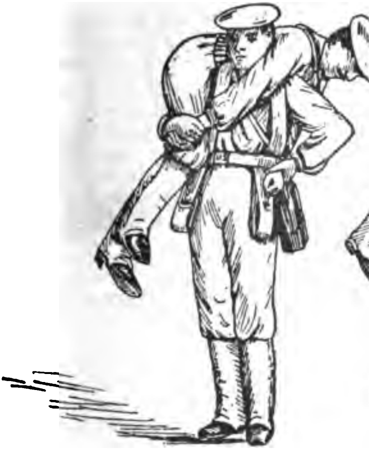

FIG. 107.

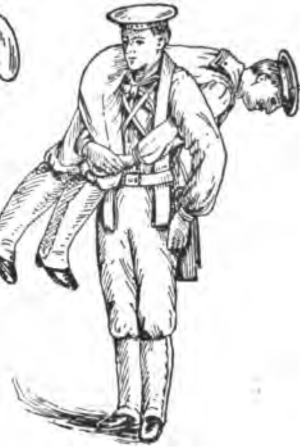

FIG. 108.

1318. Improvised stretcher.—(1) An improvised stretcher should always be tested before placing a patient on it.

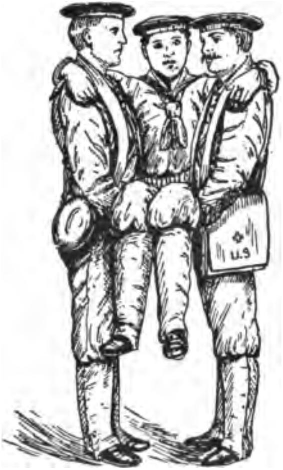

FIG. 109.

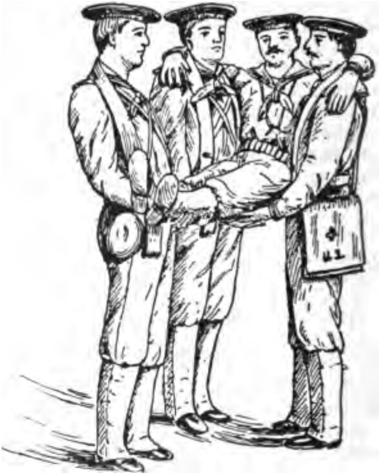

FIG. 110.

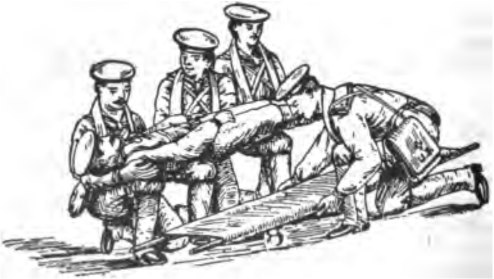

FIG. 111.

(2) Among the articles that may be employed as stretchers are boards, window shutters, doors, bed frames, mattresses, benches, tables, chairs, blankets, rugs, hammocks, etc.

(3) Rifles or poles may be passed through openings made in the bottom of sacks, or coats; or trousers may be used. The rifles or poles can be prevented from spreading too far apart by a turn of rope or telegraph wire.

1319. The rifle stretcher.—Spread a blanket on the ground, lay two rifles (magazines empty), across the middle of it, parallel to each other, and 20 inches apart, both muzzles pointing in the same direction, trigger guards outward. Turn a fold of the blanket 6 inches wide over the ends of the butts, fold the right side of the blanket over the rifle on that side as far as the rifle on the opposite side, then, similarly, fold the left side. These folds of blankets form the body of the stretcher, the butts forming the head.

1320. The pole-and-blanket stretcher.—Place two poles longitudinally along the edges of a blanket and roll the sides of the blanket snugly over the poles until they are 20 inches apart. The blankets can then be tied to the poles, and sticks of wood can be placed between the poles at each end to act as spreaders.

1321. The pole-and-rope stretcher.—Place two poles 20 inches apart, and securely lace back and forth a suitable piece of rope; this rope forms the body of the stretcher.

Sec. VII.—ORGANIZATION OF THE MEDICAL DEPARTMENT IN THE FIELD.

1322. (1) Assistance will be rendered to the wounded at four points, viz: 1. The firing line. 2. The dressing station. 3. The field hospital. 4. The base hospital.

(2) For the stretchermen to advance on the field under fire is to invite disaster. Not only may they be killed by drawing the enemy's fire in this way, but the wounded will also be similarly exposed.

(3) The hospital corps men, when called to urgent cases on the firing line, should advance by rushes, seeking what shelter may be available. They should be prepared to check hemorrhage, to secure improperly applied dressings with rubber plaster, and to administer water and stimulants where needed. They should carry knives suitable for cutting away clothing, preparing splints, etc. They should be equipped with lanterns for searching the battle field after sundown.

(4) The average percentage of casualties is 15. About one-third of this number will have to be carried off the field. When possible the hospital corps men will adjust splints and otherwise prepare the wounded for transportation, and the stretchermen will carry them to the dressing stations.

1323. The dressing stations.—(1) The dressing stations will be located 300 yards or more back of the firing line, behind some natural or artificial shelter, and out of the direct line of fire, and will be designated by a red cross flag by day and a green light at night.

(2) At this point the medical officers will dress the wounds of men not seriously disabled and will send them back to their respective companies. The other cases will be identified and tagged with their names, ship, nature of their wounds, treatment, and the probable time when another dressing will be necessary. Here tourniquets will be removed, bleeding blood vessels tied, and dressings and splints renewed when necessary. Water, liquid foods, and stimulants will be served out as required.

(3) The dressing stations should be promptly cleared of wounded.

1324. The field hospital.—(1) The field hospital will fly a red cross flag by day and show a green light at night. At this point necessary operations will be performed and dressings applied. The application of splints will be carefully looked after, and the men will be prepared for removal to the base hospital.

(2) The field hospital should be promptly cleared of wounded.

1325. The base hospital.—A hospital ship, or other ship, will usually be designated to act as a base hospital. The wounded will remain in the base hospital until they are fit for duty, or able to be sent to a home station.

Sec. VIII.—MILITARY HYGIENE.[1]

General Remarks.

1326. (1) **Camp diseases** are preventable; their presence in a command means that the laws of hygiene have been violated. Deliberate disregard of sanitary regulations is a grave military offense and should be dealt with accordingly.

(2) In ordinary campaigns sickness disables from 5 to 10 times as many as wounds.

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[1] Prepared by Surgeon C. F. Stokes, U. S. Navy, under the direction of the Bureau of Medicine and Surgery. Revised 1917.

(3) In a modern engagement it requires on an average an expenditure of from 200 to 400 rounds of ammunition for each one of the enemy put out of the fighting, and considering the number of rounds carried, this expenditure represents the effectiveness of from 1 to 2 men.

(4) When it is realized that but a single cupful of polluted water may be equally damaging by rendering a fighting man unfit for duty for many weeks, if he survives at all, and may be the means of spreading disease far and wide in a command, then the great importance of faithfully observing hygienic precautions will be appreciated.

(5) On board ship sanitary regulations can be effectively enforced, but on shore under changed conditions the maintenance of the highest efficiency of the command is dependent upon the cooperation of each individual of that command.

(6) All officers should familiarize themselves with the simple hygienic hints set forth in these regulations and they should, with the assistance of the medical officers, interest and instruct the men under their immediate command in the intelligent observance of these measures.

(7) The landing force should be prepared to combat disease-producing conditions wherever they may be encountered, whether it be in the jungles of the Tropics or in great cities.

Preparatory.

1327. The following individuals should be excluded from landing parties:

(1) Men afflicted with venereal disease.

(2) Men whose feet are deformed or sore from blisters, chafes, corns, callosities, bunions, or hammertoe.

(3) Men under 20 years and over 45 years, with few exceptions.

(4) Men convalescing from disease or injury.

(5) Men with badly decayed teeth, men with diarrheal diseases, and obese men.

Physical Betterment.

1328. (1) **Officers and men** should take part in all physical drills and should, when expedient, encourage and engage in athletic sports. These sports not only better men physically, but they develop a spirit of comradeship that is of inestimable value.

(2) **Practice marches** on shore with the men not under restraint should be undertaken regularly. This exercise would greatly improve the physically fit and would enable the medical officers to weed out the undesirable.

(3) **Gymnastic exercises** and track events, also boxing, wrestling, swimming, boat racing, base ball and foot ball should form a conspicuous part of service in the Navy. These sports, when engaged in under intelligent supervision, not only raise the physical standard of the officers and men, but their mental and moral tone as well.

Care of the Feet.

1329. (1) Neglect of the feet should be considered a punishable offense. The most important thing to do is to keep the feet absolutely clean. Many men go lame in hot weather because they try to march with dirty feet. It can not be done. If dirt and perspiration collect between the toes the skin gets tender and peels off, itches, burns, aches, and the man goes lame. The feet should be washed night and morning with soap and water and dried thoroughly. Take off shoes and socks often and air and dry the feet. Change socks every day. With two pairs of socks a man can change every day, and if on the march he can not wash a pair each day, he can at least air, sun, and dry one pair to replace those he is wearing.

(2) **Before the march** rub your socks thoroughly, sole and toes, with a moistened cake of soap until they are stiff and have a slippery, greasy feel.

(3) **After the march** soak the feet in water as hot as can be borne. If you can not get this, use cold water, but never warm or tepid water. Socks should be free from holes. A hole always means a blister.

1330. (1) **Shoes.**—The shoe is the most important single article of uniform. The regulation shoe should be worn without exception, unless on the advice of a medical officer. Special attention should be paid to the fitting of shoes.

(2) **A good marching shoe** should be large enough in all directions, but not too large. If the foot moves in the shoe it is apt to chafe and blister. A common defect in shoes is that they are too tight over the instep and too loose across the ball of the foot. If the leather forward of the instep is too slack, wrinkles will form. Folds of leather and rough inner seams should be avoided. The inner edge of the shoe should be almost straight, the sole thick and wide, projecting beyond the upper leather. The heel should be low and broad, and

the toe of the shoe should be of such a length that there will be no pressure on the ends of the toes or toe-nails.

1331. **Nails.**—The toe-nails should be cut straight across, a little behind the end of the toe, and should not be rounded. Any tendency to ingrowing should receive treatment at once.

1332. **Corns and callosities.**—Corns and callosities are due to pressure and friction from unhygienic shoes. When between the toes they are soft; on other parts they are dry and hard. They often render men unfit for duty.

(a) **Treatment.**—Remove the cause by wearing hygienic shoes. Soak the feet well in hot water, then pare the corn or callus down with a sharp knife, a fragment of glass, or with sandpaper, without wounding the skin. Soft corns should be treated by applying a dusting powder like aristol on cotton or gauze between the toes.

(b) **Salicylic-acid treatment.**—Apply the following collodion paint with a camel's-hair brush, night and morning, for several days, then soak the feet in hot water and the corns will come away painlessly:

Acid salicylic	ʒi
Extract cannabis indicæ	gr. xx
Collodii	℥i

M. S. corn paint.

1333. **Blisters.**—Save the skin; drain at the lowest point with a clean needle; or better, pass a threaded needle through and tie the thread ends, later cutting the ends and leaving the thread in the blister to come away with the skin. Protect with cotton and rubber plaster.

1334. **Excessive and foul perspiration.**—Excessive perspiration often leads to foot-soreness, blisters, fissures, and corns, and may be offensive.

(a) *Mild cases* will be relieved by dusting into the shoes and onto the feet the following "foot powder":

	Parts.
Acid salicylic	3
Pulv. amyli	10
Talci	87

This foot powder may be used with benefit before a march, especially in cases of sore or tender feet.

(b) *Severe cases.*—Severe cases will be relieved by soaking the feet, after a preliminary scrub with soap and water, in a solution of permanganate of potassium. The stain should be left on the feet. The solution should be gradually increased from 1 per cent to 6 per cent and the treatment continued nightly for three weeks. The foot powder should be used during the day.

(c) *Another method.*—Sprinkle a few drops of formalin into the shoes each morning.

1335. To toughen the feet. Men unaccustomed to marching may toughen their feet by soaking them in strong, tepid alum water (a teaspoonful to a pint).

Care of the Mouth.

1336. (1) **Mouth breathing** induces sore throat, diseases of the nose and ears, and causes thirst. Nose breathing is normal and should be employed at all times.

(2) **The teeth.**—The teeth should be brushed night and morning. Decayed teeth should be filled or pulled, as they are apt to induce abscess of the jaw, indigestion, debility, and diarrhea.

(3) **The proper chewing** of food is more important than the kind of food chewed. Thorough chewing makes food nourishing, prevents hunger, and diminishes thirst.

1337. Common drinking cups on board ship and in camp are sources of great danger through spreading disease. (See art. 1359.)

Thirst.

1338. (1) **The habit of abstaining from drinking water** on the march is an excellent one and can be acquired readily. Thirst sensations lie in the back of the throat and may be relieved by carrying any small object, as, for instance, a pebble in the mouth.

(2) **Boiled water** may be drunk at the start and near the end of the march.

(3) **Canteens** should be carried filled.

(4) Smoking on the march—as at rest periods—dries and heats the mouth and throat and greatly adds to thirst.

Bathing.

1339. (1) **A daily bath** and rub-down is desirable. The hair should be cut close and the head washed daily.

(2) On the march, the feet and groins, as well as the armpits, genitals, and anus, should be cleansed, even though only a damp cloth is available. After reaching camp the more completely the person is bathed the better.

On the March and in Camp.

1340. (1) A marching column is a healthy column.

(2) **Sources of danger:**

(a) Mosquitoes.
(b) Flies.
(c) Dust.
(d) Water.
(e) Food.
(f) Drinking cups.
(g) Climate.

Sec. IX.—HOW TO AVOID THESE DANGERS.

(a) Mosquitoes.

1341. (1) Mosquitoes transmit malarial and yellow fevers and other germ diseases. In the Tropics these diseases may prove rapidly fatal and hopelessly cripple a command.

(2) *Preventive measures:*

(a) Medicinal.
(b) Mechanical, by the use of screens, netting, etc.
(c) The destruction of mosquitoes and their larvæ and the prevention of their growth.

1342. Medicinal.—(1) Malarial fever is transmitted by the bite of anopheles mosquitoes alone. These mosquitoes become dangerous about five days after sucking the blood of infected persons, otherwise they are harmless; it follows that malarial patients should be screened with netting and actively treated with quinine to prevent the spread of the disease.

(2) The best way to rid a region of malaria is to treat with quinine all persons infected in that region. In some districts over 50 per cent of the natives are afflicted. For this reason camps should not be established within half a mile of villages, and under no circumstances should native houses be occupied.

(3) From 3 to 5 grains of quinine taken daily will greatly reduce the chances of becoming infected with malaria.

1343. Mechanical.—Screens, netting, and other mechanical devices should be used wherever it is possible to employ them. They protect the well and prevent the sick from spreading the disease.

1344. Destruction of mosquitoes and their larvæ and the prevention of their growth.—(1) Mosquitoes breed in water lodged in eaves troughs, barrels, tin cans, broken bottles, footprints, stagnant pools, ponds, and swamps. They hide during the day and are active only at night, unless disturbed. The females alone bite. A single female lays between 200 and 400 eggs, and the laying and hatching continues from early spring until November. The eggs develop in 3 days into wigglers (larvæ), which in turn become tumblers (pupæ) in 16 days. The pupæ or tumblers become full-grown mosquitoes in about 5 days, the whole covering a period of about 3 weeks.

(2) **Drying kills the eggs**, wigglers, and tumblers; petroleum promptly kills the insects in all stages.

(3) **Directions.**—Do away with all unnecessary water containers. Drain or fill in all ponds, pools, and swamps if possible. Treat all standing water with petroleum at least three times in two months, using the cheap oil, 2 tablespoonfuls to 15 square feet of surface.

A cheap and easily procured destroyer of breeding places of mosquitoes is acid sulphate of soda—"salt cake" or "niter cake"—a by-product in most ammunition plants. Use 1 pound to 50 gallons of water.

To Remove Mosquitoes from Dwellings.

1345. (1) **Close and seal doors** and windows. Burn at night 3 pounds of sulphur for every 1,000 cubic feet of space.

(2) **Pyrethrum** (insect) **powder** when burned at night will stupefy the insects and they can be swept out in the morning.

(3) **Camp fires** attract and burn mosquitoes.

Yellow Fever.

1346. (1) **Yellow fever is transmitted** by the bite of stegomyia mosquitoes alone. These mosquitoes become dangerous about 12 days after sucking the blood of persons ill with that disease.

(2) **Quinine** is without effect in yellow fever.

(3) **Directions.**—Screen all patients to prevent the contamination of mosquitoes. Screen all others to prevent them from being bitten. Destroy these mosquitoes as directed in articles 1343–1345. If yellow fever breaks out, the camp should be moved at once.

(b) Flies.

1347. (1) **The germs of many diseases**, such as typhoid fever, dysentery, cholera, and diarrhea, may be carried on the feet of flies from sinks and urinals to uncovered food, water and food receptacles.

(2) **The sinks and kitchens** should be as far apart as possible, sinks to leeward. (See article 1363 *et seq.*)

(3) **The food and drink**, after cooking or boiling, as the case may be, should be carefully protected from flies.

(4) **A single female fly** lays about 120 eggs, which mature in about 10 days. The eggs develop best in putrid organic matter, in sinks, in polluted soil, and in manure.

(5) **A clean, sanitary camp**, properly policed, is the remedy.

(c) Dust.

1348. (1) **In insanitary camps**, not properly policed, dust may carry dry filth laden with the germs of disease, to be breathed or eaten as the case may be.

(2) **Destruction of camp refuse**, cleanliness, the proper care of the urinals and sinks, and the selection of suitable camp sites are the remedies.

(d) Water.

1349. All drinking water must be boiled, distilled, or chlorinated and afterwards protected against contamination. Hypochlorite of soda (yielding 30 per cent available chlorine) 5 parts to 1,000,000 after 30 minutes renders water safe to drink. Likewise iodine may be used 15 to 25 parts to 1,000,000.

(2) **Roadside water** and raw water from streams, wells, and badly kept springs is commonly polluted with the germs of typhoid fever, dysentery, cholera, and diarrheal diseases, and should be avoided. Boiling destroys these germs and renders water fit for drinking and cooking purposes.

(3) **On going into camp** the water supply should immediately be placed under intelligent supervision and its approach protected by boards, rails, or logs, even in temporary camps.

The Water Supply.

1350. (1) **Physical characteristics of good water.**—Good water is colorless, clear, free from suspended matter, of brilliant luster, devoid of smell or taste, except that recognized as belonging to good water.

(2) **Physical characteristics of bad water.**—Bad water may occasionally have all the characteristics of good water and still contain the germs of disease. Any departure from the characteristics of good water, especially undue turbidity or the development

of odors on gentle warming, should cause it to be treated with suspicion.

1351. Sources of water.—(1) *Good.*—Rain water, water from clear ice, lakes, large rivers, and streams in uninhabited districts, artesian wells, and protected springs.

(2) *Bad.*—Rain water from polluted surfaces, snow ice, small ponds, small streams, and wells in inhabited regions, marsh water and rivers below towns and cities.

1352. (1) **How to cool water.**—Suspend it in air currents in porous earthen jars, canvas bags, or in other receptacles wrapped in wet fabrics.

(2) **How to clear turbid water.**—Add from 5 to 10 grains of alum to the gallon of water before boiling.

(3) **How to clear muddy water.**—Prepare a double barrel or box as follows: Into the larger barrel or box place sand, pebbles, charcoal, etc.; it should receive the muddy water. The small barrel, or box, with a perforated bottom, rests inside the larger and the clear water passes up into it.

(c) Food.

1353. Food and food containers contaminated by flies and germ-laden dust are the most common sources of camp diseases, such as typhoid, cholera, and dysentery.

1354. Beverages.—Uncooked milk and "soft drinks" should be treated with suspicion.

1355. Fruit.—(1) If it were possible to select fresh, ripe, sound, and scrupulously clean fruits they might be eaten with benefit.

(2) **The danger** lies in unripeness, staleness, commencing decomposition, and surface germ contamination.

(3) **Salads** and other raw food from the surface of the soil are especially dangerous.

1356. Precautions.—It is safest in camp to interdict raw foods and beverages without exception. Thorough cooking removes all danger from germ contamination, but it may be contaminated after cooking if improperly handled, exposed to flies, etc. Cooks and mess cooks should wash their hands frequently.

Cooks.

1357. Efficient cooks, drilled in the proper methods of keeping, preparing, and cooking food, and cognizant of the importance of intelligently cleansing and caring for food containers, and the preparation of drinking water, should accompany the landing force.

Badly cooked food and dirty food containers cause digestive and diarrheal diseases.

1358. **Precautions.**—All food should be carefully screened, covered, or otherwise protected from dust and flies from the time it is cooked until it is eaten. Uncooked and badly exposed food should not be eaten.

(f) Drinking Cups.

1359. (1) Drinking cups, eating utensils, lead pencils, plug tobacco, and the like should not be passed around. They have been known to spread contagious diseases like syphilis, diphtheria, mumps, and measles.

(2) Common drinking cups at scuttle butts and elsewhere should be kept submerged in formalin (1–1000) when not in actual use.

(3) Lip drinking, horse fashion, should be practiced where the cups are not disinfected.

(g) Climate.

1360. (1) **Extremes of heat and cold** are rarely causes of sickness in themselves, if camp sites are well chosen and sanitary regulations are intelligently carried out.

(2) The men should not sleep directly on the gound if it can be avoided. They should raise their beds with straw, leaves, boughs, or other means.

(3) **Badly selected camp sites** may, through dampness and other avoidable climatic influences, be responsible for pneumonia, bronchitis, colds, sore throat, and rheumatic affections.

(4) **Wet clothes.**—Little harm comes to men with wet clothes and wet foot gear if they are exercising actively.

(5) **Chilliness** from the extreme cold, or inactivity, is dangerous.

In the Tropics.

1361. (1) In the Tropics there should be moderation in diet, drinking, exercise, clothing, and work.

(2) **The abuse of alcohol** is most dangerous to health.

(3) **The diet** should be light and nutritious, much the same as at home, but diminished in amount.

(4) **Sports,** in moderation, should be encouraged for recreation. Swimming is a healthful tropical exercise.

(5) **Exposure of the head,** neck, and spinal column to the direct rays of the sun is particularly harmful and should be avoided. A wet handkerchief or wet leaves under the hat will help to prevent overheating.

(6) **Drills.**—There should be no hard work or exhausting drills between 8 a. m. and 4 p. m. During these hours necessary work only should be undertaken.

(7) **Chilling of the person,** especially of the abdomen, should be avoided. Suitable covering at night not only protects the individual from sudden changes of temperature incident to the Tropics but also against the bites of insects.

Whether in the Tropics or not, always shift into dry clothes after a wetting.

Sec. X.—CAMPS AND CAMP SITES.

(See Art. 495.)

1362. (1) **Old camp grounds** and the vicinity of cemeteries are undesirable and should be avoided whenever possible.

(2) **In hot summer months** the ground selected should be high, free from underbrush, and shaded with trees, if possible.

(3) **In cold weather,** ground sloping to the south, with woods to break the north winds, is desirable. The side of a hill is warmer than the top, and drier than the bottom.

(4) **Ground** near the foot of a hill range generally has a damp subsoil and remains muddy for a long time. Thick forests, dense vegetation, made ground, alluvial soil, punch-bowl depressions, inclosed ravines, and dry beds of streams are unfavorable. Marshy ground and stagnant water are objectionable on account of damp atmosphere and the annoyance and infection of mosquitoes.

(5) **Closely cropped turf** with sandy or gravelly subsoil is best; high banks of rivers are suitable, provided no marshes are near.

(6) If there is a **prevailing wind,** the camp should not be so located that flies will be blown from sinks to kitchens, or mosquitoes from marshy ground to the camp.

(7) **As a protection against epidemics,** temporary camp sites in the theater of operations should be changed every 2 or 3 weeks.

Sinks.

1363. (1) **On halting for the day** the first duty is the posting of sentries over the water supply and the designating of a place for relieving the calls of nature.

(2) The first task for working parties should be to dig the sinks.

(3) If the force is small and the camp is reached after dark and is to be broken early next morning, then sinks need not be dug. The men should use a designated place and should cover their evacuations with earth.

(4) Sinks should be 2 feet wide at the top, 12 to 20 feet long, and from 3 to 10 feet deep in proportion to the probable length of stay. The earth should be thrown to the rear, and a layer of a few inches from it covered in at least three times a day.

(5) Shallow sinks should be filled in when they reach within a foot of the top; deeper sinks at a lower level.

(6) All sinks should be re-covered and marked on breaking camp.

(7) A pole on forked uprights makes a satisfactory seat. Each man should cover his evacuation with earth.

(8) Straw or paper saturated with kerosene, or kerosene alone, should be burned in the sinks at least twice a day when practicable. Quicklime thrown in to cover the passages is also effective. Earth, kerosene, and quicklime should *all* be used, when possible, as no one alone is entirely satisfactory.

(9) These measures greatly diminish the number of flies about camp, and prevent the spread of camp filth and disease by these pests.

(10) The sinks should be so placed that prevailing winds blow across the camp toward them; so situated that they can not pollute the water supply, and located as far away from the kitchens as possible, yet not at such a distance as to tempt men to pollute the soil at more convenient points. They should be screened by bushes.

(11) A number of sinks are better controlled than a single large one.

(12) If the camp is but temporary a "straddle" sink may be used. This is several feet deep and not more than 15 inches wide. The occupant straddles it. It has the advantage that the edges are not contaminated with urine.

(13) About 10 a. m. daily pour kerosene into the sinks, add paper and dry leaves, etc., and set fire to them.

Urinals.

1364. (1) Urinals should be conveniently located and kept under control to avoid soil pollution. They should be quicklimed and kept covered. They should be set up at frequent intervals throughout the camp at sundown and indicated by a lamp. Oil kerosene tins answer well for this purpose. In the morning they are removed, emptied, burned out, and then sunned until time to install again for night use.

(2) Typhoid-fever germs often abound in the urine as well as in the bowel discharges.

(3) Filthiness in camp is an offense against health as well as an offense against decency.

Kitchen Pits.

1365. (1) Pits should be dug at once for the purely liquid refuse from the kitchens. They should be located in the vicinity of the kitchen, and should be covered with boards or other material to exclude flies. If boards are not to be had, brushwood, straw, grass, or something of the sort, supported by saplings laid crosswise, will answer. If possible the openings for the slops should be guarded with wire mesh, and covered with boards. The pits should be treated with kerosene from time to time and should be filled in before marching.

(2) Unless the pits are guarded, flies will breed in them and will swarm about the kitchen and camp.

(3) The solid kitchen refuse should be burned daily.

(4) In temporary camps the kitchen fire may be used for the purpose. In more permanent camps the solid refuse should be removed to a designated place and there destroyed by fire.

(5) An **incinerator** can be made with iron rails or old cans and iron junk. A good draft must be provided. If the incinerator has a shelf for solid refuse, liquid refuse can be poured over it a little at a time when the rest has begun to burn well.

Or two trenches can be dug with sloping sides intersecting at right angles and a barrel (set on stones and heaped around with turf) set up in center to receive material to be burned.

CHAPTER IX.

MAPPING AND SKETCHING.

Sec. I.—MAP MAKING.

1366. Maps are indispensable in the field; without them it is impracticable to conduct the simplest operations with skill and efficiency, and reports of operations are usually incomplete unless accompanied by a sketch or map.

1367. Usually maps of some kind are available, but these are often on too small a scale for military use, and experience has shown that they are often inaccurate and misleading. Moreover, commercial maps do not contain the necessary data or information required for military operations. The data a military map should contain consist of all those features which are important in military operations, such as the width and condition of roads; grades and slopes; type, strength, and material of bridges; width, depth, and velocity of streams; location of woods, camp sites; positions of defense, etc. (see art. 1406 et seq.).

1368. There are several kinds of maps, some or all of which may have to be prepared, as follows:

(1) **Road sketches.**
(2) **Position sketches.**
(3) **Place sketches.**
(4) **Landscape sketches.**

1369. A road sketch is the type most often required. It consists in mapping a road or trail from a given starting point to a given finishing point, including a belt about 300 yards wide on each side of the road. All features of military importance, including the configuration of the country, are required.

Road sketches are usually made on a scale of 3 inches to the mile, i. e., 3 inches on the map represent 1 mile on the ground. The scale of the map must always be shown, otherwise it will convey no information as to distance. This applies to every kind of map except a landscape sketch.

1370. Position sketches are those which show an area, rather than a belt of territory, as in a road sketch. They are made when it is desired to map an occupied position, such as a battle-field or outpost position. The area must cover the position held by our own troops as well as the area in front toward the enemy. The scale of a position sketch is usually 6 inches to the mile because more detail, particularly with regard to cover and accuracy as to ranges, is required. In siege operations or where otherwise necessary the scale is as large as 12 inches to the mile.

1371. Place sketches are required for the same purpose as position sketches and are made on the same scale. For a position sketch all the area to be mapped can be covered by sketching parties, whereas a place sketch by reason of the inaccessibility of part or all of the area, as for example, where it is in enemy territory, must be sketched from one or more positions on elevated ground within our own lines, or within close proximity to them.

1372. Landscape sketches are in fact pictorial drawings. They are used to amplify and make clear the area shown by a place or position sketch. No scale is used. The location of the sketching station must be properly indicated on the sketch.

Scales.

1373. The scale of a map can be indicated in several different ways, the most usual of which are the following:

(1) By **words and figures**: 3 inches = 1 mile.

(2) By what is known as the **representative fraction**, abbreviated "R. F.," thus: $\text{R. F.} = \frac{1}{21120}$.

The numerator of the R. F. is always unity, and may represent any unit of measure (inch, foot, meter, etc.). The denominator of the R. F. indicates the number of units of measure *on the ground* represented by one of the *same units* on the map.

(3) **Graphically**, by drawing a line of certain length and subdividing it into units which represent the number of yards or miles on the map. This is called a **reading scale**.

1374. Figure 112 shows the scales most commonly employed. The reading scales are accurate within approximately 1 per cent and may be used in the preparation of working scales.

1375. A working scale is for convenience in map making. It differs from a reading scale only in the units in which it is graduated. These units may be those of distance (for example, the length of 1 pace of the individual who is making the sketch), or of time (for example, the distance traveled in one minute by the individual, or horse, at his normal stride). The former is more accurate; the latter is more convenient when the sketcher is mounted.

1376. (1) The unit of measure generally employed to make a working scale is the length of the sketcher's pace. This differs with the individual, and must be accurately known. To determine the length of the pace, an accurately measured distance, say 100 yards, is laid out with a tape and marked. Pace this distance carefully a number of times without increasing the cadence or length of your normal pace. Reduce the measured distance to inches and divide by the number of paces required for 100 yards; the resultant gives the length of your pace. Where the length is found to be, say, 30 and a fraction inches, call the stride 30 if the fraction is less than one-half inch and 31 if more than one-half inch.

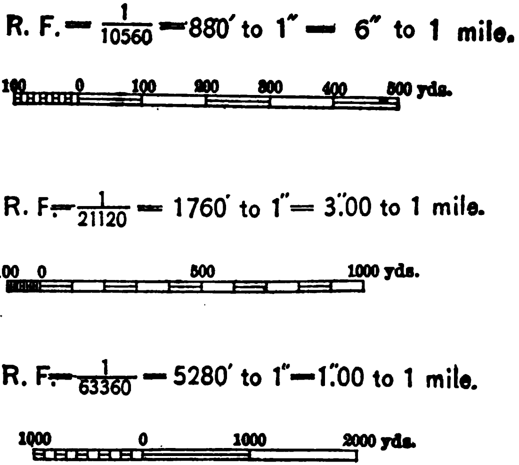

R. F. = 1/10560 = 880′ to 1″ = 6″ to 1 mile.
100 0 100 200 300 400 500 yds.
R. F. = 1/21120 = 1760′ to 1″ = 3.″00 to 1 mile.
100 0 500 1000 yds.
R. F. = 1/63360 = 5280′ to 1″ = 1.″00 to 1 mile.
1000 0 1000 2000 yds.

FIG. 112.

The working scale curve of paces is shown in true size in figure 113. Using the line appropriate for the length of your pace and the scale on which the sketch is to be made, mark a piece of paper with the intervals as on the scale. The working scale is marked in single paces. It is usually more convenient to count double paces (strides), i. e., the number of times the left foot strikes the ground, in which case mark the divisions on the scale as appropriate for double paces.

Make your working scale about 6 inches long. Mark the *second* division zero, then the third, fourth, etc., 1, 2, etc., representing 100, 200, etc., paces. Subdivide the division to the left of the zero mark to represent 25, 50, 75, and 100; this enables you to measure distances accurately which are less than 100 paces, or other measure less than a whole division of the scale.

(2) The working scale for time is constructed in a similar manner. It is based on the principle that equal distances will normally be passed over in equal times. Pace a known distance a number of times and note the time required to cover this distance. Then compute the time in minutes required to cover 1 mile. The scale can then be made from the working scale curve of time, shown in true size in figure 114.

Contouring.

1377. Contouring is the method by which the slopes and physical features of the ground are shown on a map. A **contour line** (or **contour**) is one that connects all points of equal height above a horizontal plane known as the **datum plane**. The datum plane is ordinarily taken to be at sea level, and all heights shown are the actual heights above this plane.

Contour lines have certain characteristics. A knowledge of these is essential in map reading or in locating contours on a map.

(1) A contour line never joins or crosses another contour except in rare cases, as described in paragraph 8.

(2) When spaced at a uniform distance they indicate a uniform slope.

(3) When closely spaced they indicate a steep slope and when far apart a gentle slope.

(4) When spaced close together near the top of a hill and far apart at the bottom they indicate a *concave* slope; and, vice versa, a *convex* slope.

(5) A typical contour line is a wavy line, alternately salient and reentrant.

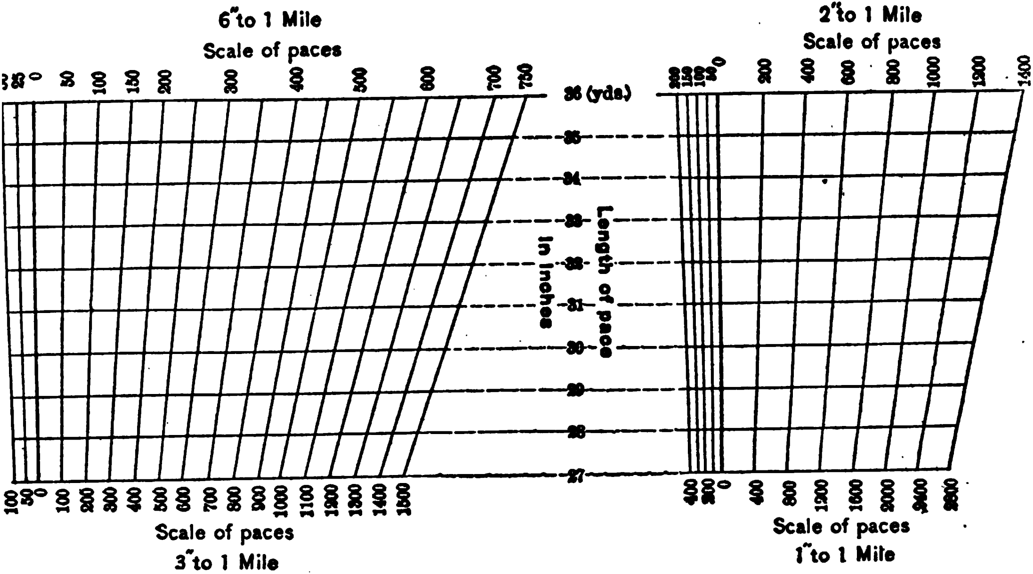

6" to 1 Mile
Scale of paces
25
0
50
100
150
200
300
400
500
600
700
750
2" to 1 Mile
Scale of paces
200
150
100
50
0
200
400
600
800
1000
1200
1400
36 (yds.)
35
34
33
32
31
30
29
28
27
Length of pace
In inches
100
50
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
Scale of paces
3" to 1 Mile
400
200
0
400
800
1200
1600
2000
2400
2800
Scale of paces
1" to 1 Mile

FIG. 113.

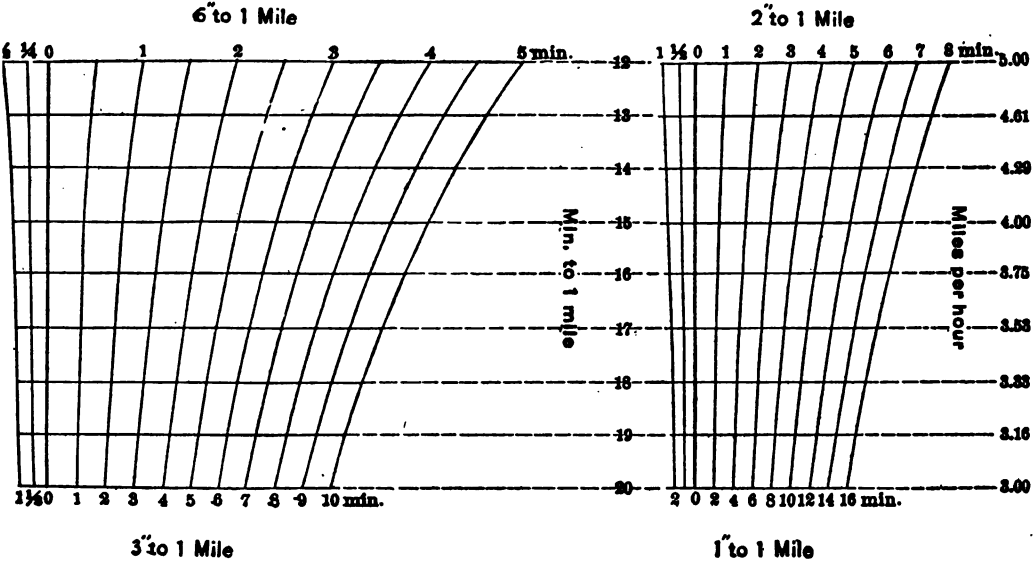

6" to 1 Mile
½ ¼ 0 1 2 3 4 5 min.
3" to 1 Mile
1 ½ 0 1 2 3 4 5 6 7 8 9 10 min.
Min. to 1 mile
12
13
14
15
16
17
18
19
20
2" to 1 Mile
1 ½ 0 1 2 3 4 5 6 7 8 min.
1" to 1 Mile
2 0 2 4 6 8 10 12 14 16 min.
Miles per hour
5.00
4.61
4.29
4.00
3.75
3.53
3.33
3.16
3.00

FIG. 114.

(6) When a contour line joins itself it indicates an elevation or depression in the included area.

(7) Contours that cross streams or gullies invariably run upstream, i. e., as the contour line approaches a stream it curves sharply toward the source and then at the crossing curves sharply in the other direction.

(8) Where contour lines of different elevation meet, it indicates a cliff at that point. In very rare cases the upper contour may cross the lower, which indicates an overhanging cliff.

(9) Maximum ridge and minimum valley contours go in pairs. A single lower contour can not lie between two higher ones, or a single higher between two lower. When two adjacent contours have the same elevation the ground between them will be still lower if they are valley, and still higher if ridge, contours.

1378. By **contour interval** is meant the difference in elevation, measured in feet, between points on adjacent contours; it is also called **vertical interval** (abbreviated "V. I."). On a map the elevation of contour lines above the datum plane is indicated by marking certain ones with their elevation.

The contour interval depends on the scale of the map. With a uniform contour interval a small-scale map would have the contours spaced so closely together that it would be impossible to show other important details; and, on the other hand, a contour interval suitable for a small-scale map would fail to show the necessary details required for a large-scale map. For this reason the following standard has been adopted for United States military maps:

Scale:
1 inch to the mile, contour interval 60 feet.
3 inches to the mile, contour interval 20 feet.
6 inches to the mile, contour interval 10 feet.
12 inches to the mile, contour interval 5 feet.

1379. Map distance (M. D.) is the actual distance *on the map* between two adjacent contour lines, at a given point and in a given direction. It is usually expressed in inches and fractions of an inch. It is also called the **slope equivalent.**

The **horizontal equivalent** (H. E.) is the actual *horizontal distance* between adjacent contours on the ground. It is usually measured in feet. It is the base of a right triangle whose altitude is the vertical interval, whose hypotenuse is the actual ground distance between contours, and whose lower acute angle is the angle of slope (S).

$$\text{M. D.}=\text{H. E.}\times\text{R. F.}\times 12, \text{ and}$$

$$\text{H.E.}=\frac{\text{V. I.}}{\text{tang } S}=\frac{\text{V. I.}}{S \text{ tang } 1^\circ}=\frac{\text{V. I.}\times 57.3}{S},$$

$$\text{therefore M. D. (in inches)}=\frac{\text{V. I. (in feet)}\times 688}{S \text{ (in degrees)}}\times\text{R. F.}$$

1380. A scale of map distances shows the respective map distances for a slope of 1°, 2°, 3°, etc.

To construct such a scale it is only necessary to substitute values in the preceding equation, and lay off the resulting distances on a right line. For example, if the scale of the map is 3 inches to the mile, we have

$$\text{M D. for } 1^\circ=\frac{20\times 688}{1}\times\frac{1}{21120}=.65 \text{ inch.}$$

The distance for 2° is one-half of the distance for 1°; for 3° it is one-third, etc. (see fig. 115).

1381. Map distances afford a convenient and rapid method of determining contour points on any line of a map the gradient of which is known.

The method employed is as follows: Standing at a point on the terrain corresponding to one end of the line, determine the gradient by means of the slope board (see art. 1388), or if the slope is not uniform, determine the gradient to the point where the slope changes; note this point, determine its distance from the starting point, usually by pacing, and having arrived at the point of change of slope, determine the gradient of the next section of the line, and so on. Then lay off on the map successive contour points at a distance apart equal to the map distance for the observed slope, stopping at the point corresponding to the change of slope. Proceed in similar manner for succeeding sections of the line. Where any point of change of slope does not exactly coincide with a contour point, the remaining fraction of the map distance corresponds to the same fraction of the vertical interval; and the remaining fraction of the

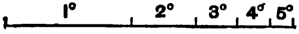


FIG. 115.

vertical interval is then reduced to a corresponding fraction of the map distance for the new slope.

A similar adjustment is made in locating the first contour point on a line, if the starting point falls between contours.

1382. It will not be practicable to draw in contour lines accurately without a complete traverse of the hill or slope to be contoured. In such a case control lines marking the prominent ridges and depressions must be plotted and the points where the contours cut these lines noted. Later the points of equal elevation must be connected and the heights of these shown, after which the control lines may be erased.

For ordinary sketches it is only necessary to show the **form lines** of the hill or slope—by which the form of the hill, the steepness of the slope, and its approximate height, as well as the position of the hill with regard to the road are plotted on the sketch.

Sec. II.—MAP READING.

1383. While only a comparatively small number of officers will in general be required to make maps, skill in map reading is of the first importance for all officers.

The ability to read maps, such as the one shown in Figure 126, can be readily acquired with a little practice and study. In map reading, it is not only important to visualize the configuration of the ground by understanding what is represented by the contours, but also a familiarity with the conventional signs is required. For the most part these are easy to learn because they represent graphically what they are intended to show. The most usual conventional signs are shown in Figure 116.

In using these signs in map making, care should be taken not to crowd the map to such an extent as to hide the salient features of importance. Modern practice permits the outline of woods, orchards, cultivated fields, etc., to be indicated by an outline with the words "woods," "orchard," etc., written within to show what is represented.

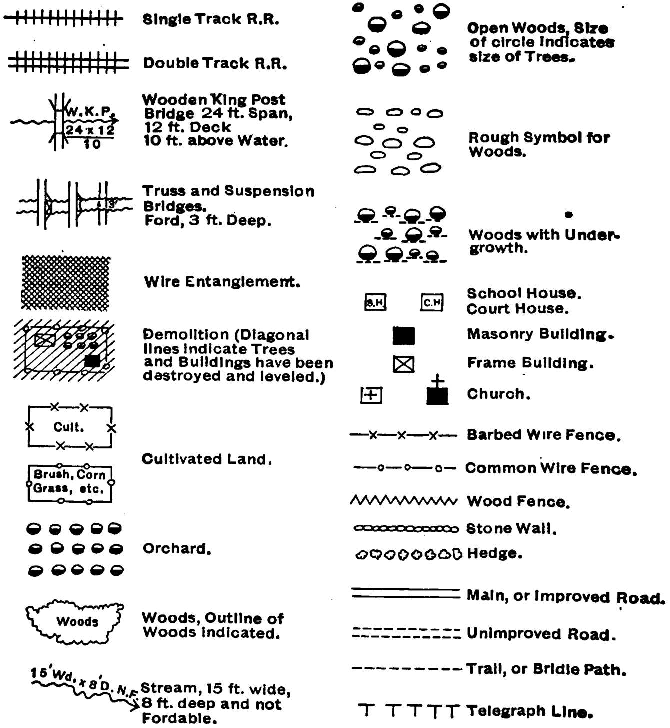

Single Track R.R.
Double Track R.R.
W.K.P.
24 x 12
10
Wooden King Post Bridge 24 ft. Span, 12 ft. Deck 10 ft. above Water.
3'
Truss and Suspension Bridges.
Ford, 3 ft. Deep.
Wire Entanglement.
Demolition (Diagonal lines indicate Trees and Buildings have been destroyed and leveled.)
Cult.
Brush, Corn Grass, etc.
Cultivated Land.
Orchard.
Woods
Woods, Outline of Woods indicated.
15' Wd. x 8' D. N.F.
Stream, 15 ft. wide, 8 ft. deep and not Fordable.
Open Woods, Size of circle indicates size of Trees.
Rough Symbol for Woods.
Woods with Undergrowth.
S.H
C.H
School House.
Court House.
Masonry Building.
Frame Building.
Church.
Barbed Wire Fence.
Common Wire Fence.
Wood Fence.
Stone Wall.
Hedge.
Main, or Improved Road.
Unimproved Road.
Trail, or Bridle Path.
Telegraph Line.

FIG. 116.

The following abbreviations are authorized for use on field maps and sketches:

Abbreviations.

A	Arroyo.
abut	Abutment.
Ar	Arch.
b	Brick.
B. S	Blacksmith shop.
bot	Bottom.
Br	Branch.
br	Bridge.
C	Cape.
cem	Cemetery.
con	Concrete.
cov	Covered.
Cr	Creek.
d	Deep.
cul	Culvert.
D. S	Drug store.
E	East.
Est	Estuary.
f	Fordable.
Ft	Fort.
G. S	General store.
gir	Girder.
G. M	Gristmill.
i	Iron.
I	Island.
Jc	Junction.
k. p	King-post.
L	Lake.
Lat	Latitude.
Ldg	Landing.
L. S. S.	Life-saving station.
L. H	Lighthouse.
Long	Longitude.
Mt	Mountain.
Mts	Mountains.
N	North.
n. f	Not fordable.
P	Pier.
pk	Plank.
P. O	Post office.
Pt	Point.
q. p	Queen post.
R	River.
R. H	Roundhouse.
R. R	Railroad.
S	South.
s	Steel.
S. H	Schoolhouse.
S. M	Sawmill.
Sta	Station.
st	Stone.
str	Stream.
T. G	Tollgate.
Tres	Trestle.
tr	Truss.
W. T	Water tank.
W. W	Water works.
W	West.
w	Wood.
wd	Wide.

1384. The ability to read contours quickly and accurately is most readily acquired as follows: Pick out a road or stream on the map and consider yourself at some given point, proceed along the road or stream and visualize the configuration of the country as you go.

1385. A series of most important problems in this connection is the class known as **visibility problems**. Select two points on a map, consider yourself at one of them, and determine whether or not the other point is visible from the assumed point. The problem can be solved in several ways:

(1) **By making a profile.** This is done by connecting the two points by a right line, and constructing a profile, as indicated in Figure 117. In this case it is desired to determine if the bridge at *C* can be seen from the observer's station on the hill at *A*. In this particular problem, the bridge and observer's station are connected by the road *ABC*, which is straight, and no other right line need be drawn between the stations for construction of the profile.

After constructing the profile draw a tangent from *A′* to *B′* and prolong it to *D′*. It can be readily seen that the lower limit of visibility is *D′*, and as the bridge *C′* is below this point it can not be seen from the observing station at *A′*.

(2) **By ratio and proportion.**—This method is the one most usually employed. It is quicker than the profile method and just as accurate.

Assume the observer's station as *A* and take the bridge at *C* for determination of visibility as before.

Observe the point between *A* and *C* which is most likely to obstruct the view of *C*. This point appears to be on the hill at *B*.

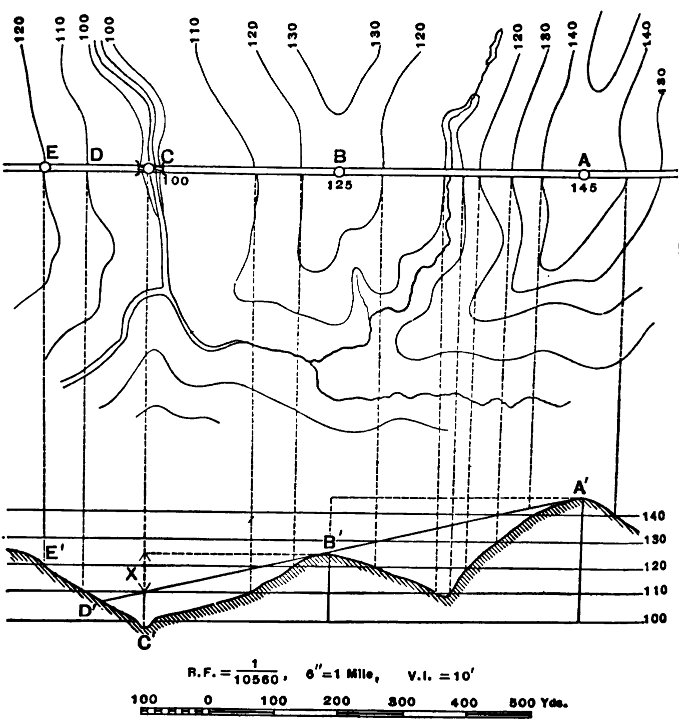


FIG. 117.

Measure the distance from *A* to *B* with the scale of the map, and say the distance is found to be 400 yards. Similarly measure the distance from *B* to *C*, which is found to be 290 yards. Note that the difference in elevation between A and B is 20 feet (145 − 125), and the difference in elevation between B and C is 25 feet (125 − 100). That is, the observer is 20 feet above, and the bridge 25 feet below, the obstructing point. Then if x represents the greatest vertical distance below the level of the obstructing point which can be seen,

$$x : 20 = 290 : 400$$

or

$$400x = 20 \times 290$$

$$\therefore x = 14.5 \text{ feet.}$$

But since C is 25 feet below B it is 10.5 feet lower (25 − 14.5) than the lowest point that can be observed from A, and is therefore not visible from A.

Sec. III.—INSTRUMENTS.

1386. The compass.—There are two general forms of this instrument, one of the fixed and the other of the movable card type. The most usual forms are shown in figures 118 and 119; the prismatic compass of movable card type and the box compass of fixed card type. The card of the box compass is graduated counter-clockwise from

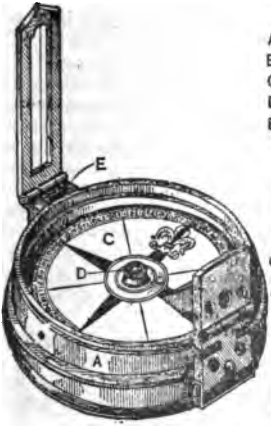


FIG. 118.

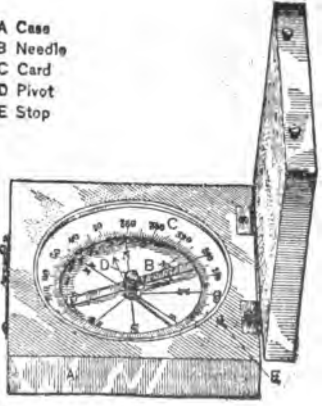


FIG. 119.

N. 360° to N. again; that of the prismatic compass is similarly graduated, but in a clockwise direction.

The compass must be held in a level position to permit an accurate reading. Bearings are taken by means of the sights in the prismatic compass, and by sighting along the box lid in the box compass. The reading is taken by shifting the eye to the reading prism or needle without changing the position of the instrument.

1387. The declination of the compass (also called variation) is the angle the compass needle makes with true north, and for ordinary latitudes may vary from 20° W. to 20° E. For high latitudes the declination is greater and more irregular. Abnormal deflections of the needle due to local disturbances are sudden and erratic. In plotting the result of a traverse, abnormal deflections, therefore, should not be distributed among all the courses of the traverse, but only among those in which there is reason to believe the disturbance occurs.

A simple way to detect—not measure—such disturbances is to take frequent back sights. If the position of the needle is normal at both stations, the sight and back sight will differ by 180°. If there is local attraction on the course, it will usually be stronger or cause greater deflection at one station than the other, and the sight and back sight will not differ by 180°. A good needle requires time to settle even when the case is firmly supported, and the user should cultivate the knack of catching it at the middle of the swing, which is the desired reading. Always sight a *fixed card* compass from the south end of the card and read the north end of the needle.

With the prismatic compass the reading is taken through a reflecting, inverting, magnifying prism. The prism revolves on an axis and is over the circumference of the card for reading, and against the edge of the case for carrying. It slides up and down the support which attaches it to the case, thereby permitting it to be focused on the scale.

1388. The slope board is a simple instrument made to read slopes, and is constructed as follows: Drop a perpendicular from the point *C*, on the sighting edge of the board. With a radius of $5\frac{3}{4}$ inches, scant, describe the arc *ADB*. A chord of $\frac{1}{10}$ of an inch will then subtend an angle of 1° at *C*, and the circumference of the semicircle can then be graduated as shown in figure 120.

The plumb bob is suspended by a string from the point *C*, and the slope is readily determined by sighting at the object while holding the board in a vertical plane. When the line is steady the board is quickly tilted so as to draw the line across the scale.

1389. The **drawing board** is a thin, smooth, rectangular board 12 by 15 inches, to which the paper is attached by thumb tacks or rubber bands.

1390. The **sketching case** in its simplest form, is shown in figure. 121. This type is known as the **Cavalry sketching case.**

The compass is set in the board and a movable index is provided, which can be revolved to place it parallel to the assumed meridian on the map. When the needle is brought parallel to the wires the board is said to be **oriented.** The needle may be parallel to the index wires, but end for end, or 180°, out of its true position, in which case the sketcher is turned completely around. Such a mistake is so obvious that it needs no preventive, but a sketcher may note at the outset whether the north or south end of the needle is toward the stud which is used to move the index wires.

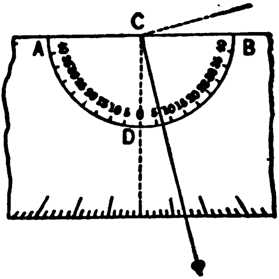


FIG. 120.

The **ruler,** marked in inches and yards, is pivoted to a **slide,** moving in a slot in the radial arm, pivoted in turn to the board near the compass. The screw clamp clamps the ruler and slide with respect to the arm, and the locking screw clamps the arm to the board. The combination permits the ruler to be set on any point of the board and in any direction through that point and clamped there.

To facilitate road sketching, rollers are provided on which 30 or 40 inches of paper may be placed. The paper should roll on and off the undersides of the rollers.

To use the board as a slope board, loosen the locking screw and the ruler clamp; secure the ruler to the radial arm by inserting the stud at the end of the ruler in the notch at the end of the radial arm; tighten the ruler clamp. The ruler and radial arm then swing free from the pivot near the compass. The tops of the roller screws are then used as a sighting line and the angle is read from the left edge of the arm, on the scale at the bottom of the board.

A scale of map distances from 1° to 5° slope, for 6-inch and 4-inch scales, is marked on the case below the roller screws; from these the map distance scale for any scale of map can readily be constructed.

1391. The **plane table** in its simple form is a sketching case or drawing board mounted on a light tripod. The compass may be mounted on theboard or separate from it. The board is leveled by the eye, or a small spirit level may be used. The **alidade** which is used in sketching with the plane table is a small flat ruler, not attached to the board, with folding sights, or, more commonly a simple three-cornered piece of wood with straight edges, the sights being taken along its upper edge.

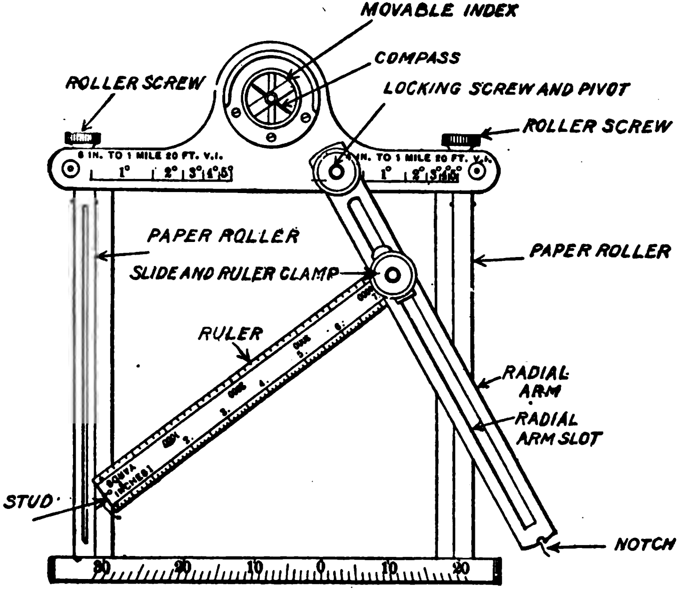
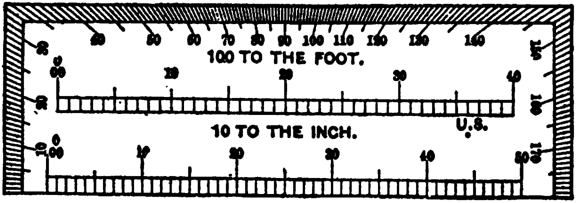


FIG. 121.

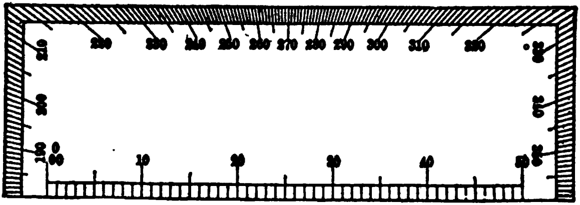
1392. The **protractor** is an angular scale of equal parts used for plotting azimuths.

Azimuths are bearings between stations taken in the direction of progress of the reconnaissance. Bearings taken in the other direction are called **back azimuths.**

The type of protractor adopted for reconnaissance is the rectangular form. (See fig. 122.)



A face.



B face.

Fig. 122.

It is graduated on one face, which will be called the A face, from 0° to 180°, and on the other, or B face, from 180° to 360°. The graduation is clockwise on both faces. It has a scale divided into 100 subdivisions to the foot, and a scale of inches and tenths along one edge.

The protractor may be used as a ruler. scale, triangle, and parallel ruler.

1393. The **aneroid barometer** is an instrument used to determine the pressure of the atmosphere in inches. The pressure varies with the altitude above the sea level, and it also varies with the moisture, temperature, latitude, etc.

The pocket type has a double scale on the reading face of the instrument, graduated counter-clockwise. The inner scale is marked in *inches* for recording the atmospheric pressure; the outer scale is graduated in *feet*, and approximate elevations may be read from this scale.

The barometer must be carefully handled as it is sensitive to shock. It should be carried in an inner pocket, by which means errors due to differences in temperature can to a considerable extent be eliminated.

There is a change in barometric readings due to changing atmospheric conditions. This amounts, ordinarily, to not more than 20 feet per hour.

The following table gives approximate altitudes corresponding to different pressures:

Pressure.	Altitude.	Pressure.	Altitude.	Pressure.	Altitude.
Inches.	*Feet.*	*Inches.*	*Feet.*	*Inches.*	*Feet.*
18	13,918	23	7,239	28	1,880
19	12,445	24	6,080	29	924
20	11,047	25	4,968	30	000
21	9,718	26	3,899	30.5	−451
22	8,451	27	2,871		

Sec. IV.—SKETCHING.

1394. The following outfit is desirable: A drawing board, paper, thumb-tacks, compass, clinometer (slope board), rectangular protractor, plotting scales, lead pencil (No. 3 or 4), rubber eraser, 25-foot tape, 100 feet of twine, watch, pocket-knife, canvas cover for board and paper, notebook, and field glasses.

When the cavalry sketching case is used only the extra articles not part of the sketching case need be provided.

Road Sketching.

1395. A road sketch will be long and narrow, and two or more sketches should be got on a board if possible. In this way a board of the standard size will hold a fair day's work. When a section runs off the paper mark it with a letter, as *A*, and make a note, *Continued at B*. Mark the beginning of the next section *B* and write, *Continued from A*.

Wherever else a road runs off the map, make a marginal note, "To ——, —— miles," giving the name and distance of nearest settlement or conspicuous topographical feature. If the road crosses one parallel to the main route, write also "To crossing, —— miles."

1396. Traversing with oriented drawing board.—A drawing is said to be oriented when so placed that its true meridian is parallel to the true meridian on the ground. When a map is oriented with any given point vertically over the corresponding point on the ground, a ruler held on the point or station on the map, and pointed in the direction of any object, gives the azimuth of that object on the map. No angular measurements need be made. This method of determining azimuths is called the **plane table method.**

When using magnetic azimuths, making the magnetic meridians —map and ground—parallel, may be accepted as a proper orientation. A compass affords the quickest means of orienting the map.

To run a traverse by this method, assume on the map the initial point and the magnetic meridian, selecting them so that the general direction of the traverse will coincide with the longest dimension of the paper. Place the board over the first station; lay the compass on it with the north and south line parallel to the assumed meridian, and turn the board until the needle reads north. The board is then oriented, and must be in this position whenever a sight is taken. It should also be level, as nearly as can be determined by the eye.

Place a ruler on the station point of the map and sight it in the direction of any object which it is desired to plot. Draw a line along the edge of the ruler and on it lay off to the adopted scale the distance of the object if known or assumed. When all the desired azimuths have been taken from the station, sight the ruler to the second station and draw its azimuth, and then proceed to that station, pacing the distance. Arrived at the forward station, plot the paced distance, orient the board over the station, and proceed as before. If any of the objects taken at the first station can be seen from the second, new azimuths may be taken to them which will locate them by intersection, Figure 123. If no compass is at hand, orient the board arbitrarily at the first station, and at the second station orient it by placing the ruler on the line between the two, and sighting back to the station just left. Figure 124 shows the relative positions of board and ground at four successive stations.

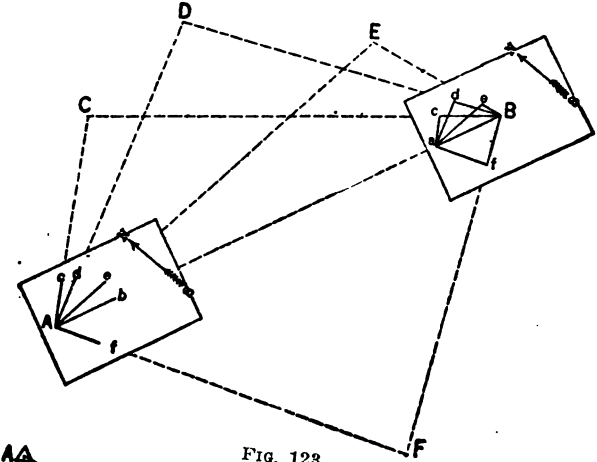


FIG. 123.

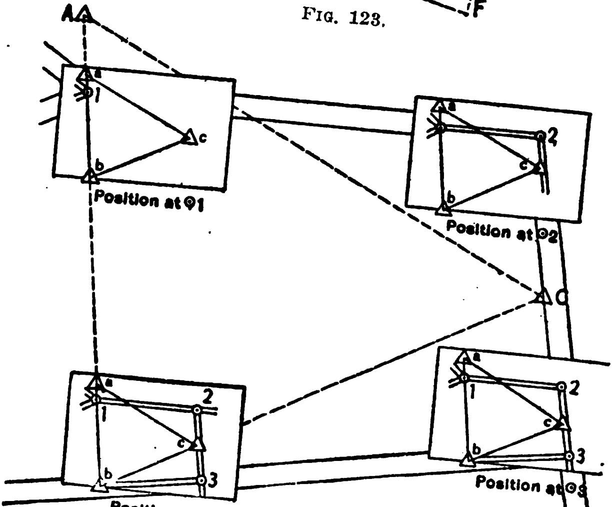


FIG. 124.

1397. Traversing with sketching case.—The same method is employed as in traversing with the drawing board or plane table (see Art. 1396). If the traverse runs off either edge of the paper draw a meridian through the last station, roll back the paper until that station is off the board, plot the same station in a new assumed position with a new meridian through it, and continue the sketch. When the paper is cut and one position of the station placed over the other with the two meridians coinciding, the two parts of the sketch are in their true relative positions.

A good road sketch made in accordance with the foregoing principles is shown in Figure 125.

The initial station is marked 1 and is shown in the lower right-hand margin of the sketch. Other stations are shown at 2, 3, 4, etc.

1398. Improvised instruments.—By the oriented-map method a very good sketch may be made with improvised instruments. Any smooth surface on which lines will show will answer for the board and paper. The edge of a book, an envelope, or a piece of paper carefully folded makes the ruler. A narrow strip of paper folded double several times makes a scale of equal parts.

Position Sketching.

1399. (1) A position sketch involves the mapping of an area rather than a narrow belt of country.

The size of the area depends on the purpose the sketch is to fulfill. Ordinarily, the width from flank to flank is made long enough to include the area occupied by a defending or attacking force or the area occupied by an outpost.

The depth is from 2 to 2½ miles and includes the area in front of an occupied position as well as an area in rear, if required.

It has been found that a single party of three persons (one chief of party and two sketchers) can sketch an area one-half mile by two miles in one day, and consequently this area is the largest usually assigned.

(2) As a preliminary to any position sketch a reconaissance must be made to determine the position. This line will normally be the one to be occupied by our troops. The base line (or control line) will be either a straight line or a line consisting of successive sections of straight line. The position of the controlling points marking the ends of the line (and each junction, if a broken line) are located as accurately as possible. The areas are then assigned, each consisting of approximately one-half mile along the line and 2

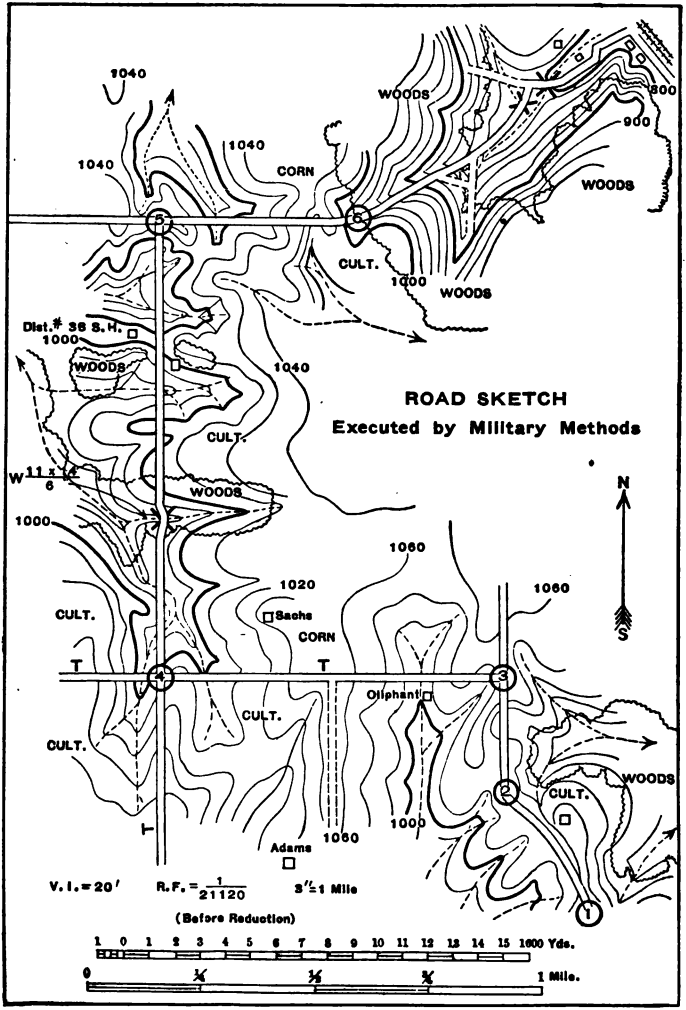

ROAD SKETCH
Executed by Military Methods
1040
1040
1040
CORN
WOODS
800
900
WOODS
CULT.
1000
WOODS
Dist.# 38 S.H.
1000
WOODS
1040
CULT.
W 11 x 14 / 6
WOODS
1000
N
S
1060
1060
1020
Sachs
CORN
CULT.
T
T
Oliphant
CULT.
CULT.
WOODS
CULT.
1000
1060
Adams
1
2
3
4
5
6
V. I. = 20′
R.F. = 1/21120
3″=1 Mile
(Before Reduction)
1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 1600 Yds.
0 ¼ ½ ¾ 1 Mile.

FIG. 125.

miles normal to the line. At junction points the areas will be triangular or wedge-shaped, and the distance along the base line will be more, or less, than the one-half mile assigned to other areas.

(3) Where the base line is established along one side of the areas, all sketchers will work on one side of the line—when established along the center of the position, parties will work on both sides of the line.

1400. (1) Figure 126 shows a typical position sketch executed in accordance with military methods. The chief control officer, accompanied by the entire sketching party, starts at *A′*, and proceeds along the control line to *B′* and *C′*, and the successive areas are assigned along the control line. Sketchers, as they arrive at their successive places for starting work, leave the party and proceed with the sketching, as below indicated. Stakes are driven at *A′*, *B′*, and *C′*, on which are marked their elevations by aneroid barometer, and magnetic azimuths of the dividing lines, perpendicular to the control line. The control line, so marked, determines the limits of the areas to be sketched.

(2) Sketcher No. 1 of party No. 1 leaves the party at *A′*, and sketches along the road from *A′* to *A*, extending the sketch for 300 yards to the right and left of the road. On arriving at *A* he sketches toward *X* in a similar manner.

(3) Sketcher No. 2 of party No. 1 and sketcher No. 1 of party No. 2 leave the party at *B′* and proceed to sketch along the line *B′B*, extending the sketch on either side for 300 yards. When the point *B* is reached the sketch is cut apart on the line *B′B*, which is merely the cutting line of the sketch. It is not necessary that the sketchers follow the line *B′B*, but they should so direct the traverse as to secure, in the most convenient manner, reliable data for 300 yards on each side of the line *B′B*.

After the sketch is cut apart, each of the sketchers takes the part of the sketch pertaining to the area assigned to his party and from the point *B*, sketches along the outer boundary of his own area. Sketcher No. 2 of party No. 1 joins his party at *X*.

(4) Meanwhile the chief sketcher of party No. 1, leaving the chief control officer at *B′*, has run a careful traverse from *B′* to *A′* and has then proceeded toward the outer extremity of his area looking for his two sketchers. Having ascertained their whereabouts he keeps in touch with them in order that there may be no delay in getting them together on the outer boundary of the area.

(5) When the party assembles at the point *X*, the chief sketcher will have a plotted traverse showing the distance between the paral-

lel lines *A′A* and *B′B* and the sketchers of the party will have each a sketch of a strip of topography about 300 yards wide along each edge of the area, which, when placed alongside the sketches of the adjacent areas, will accurately match as to topography, and will require no adjustment in either elevation or distance. The known portion of the area (first sketching party) is represented by the shaded portion in Fig. 126. The separate sketches are now placed one over the other, the distance between them being known from the traverse *B′A′*, and the azimuths of *A′A* and *B′B* (usually parallel) enable the sketches to be placed in their correct relative positions.

With the sketches in position, a knife cut is made clear through both sketch sheets and the blank parts are removed. The edges will fit along the line XY (the cutting line) and the sketches are secured in position with thumb tacks.

(6) The party now proceeds along the center of the area, connecting up contours and topographical features and adjusting differences. The strip will ordinarily be so narrow that little if any instrumental work will be required to fill in the interior.

(7) The other parties map their areas in a similar manner. When all have been completed, they are assembled in their proper order and pasted together along the upper and lower margins.

(8) The sketch is then traced and printed, or blue prints are made from the original sketch.

Place Sketching.

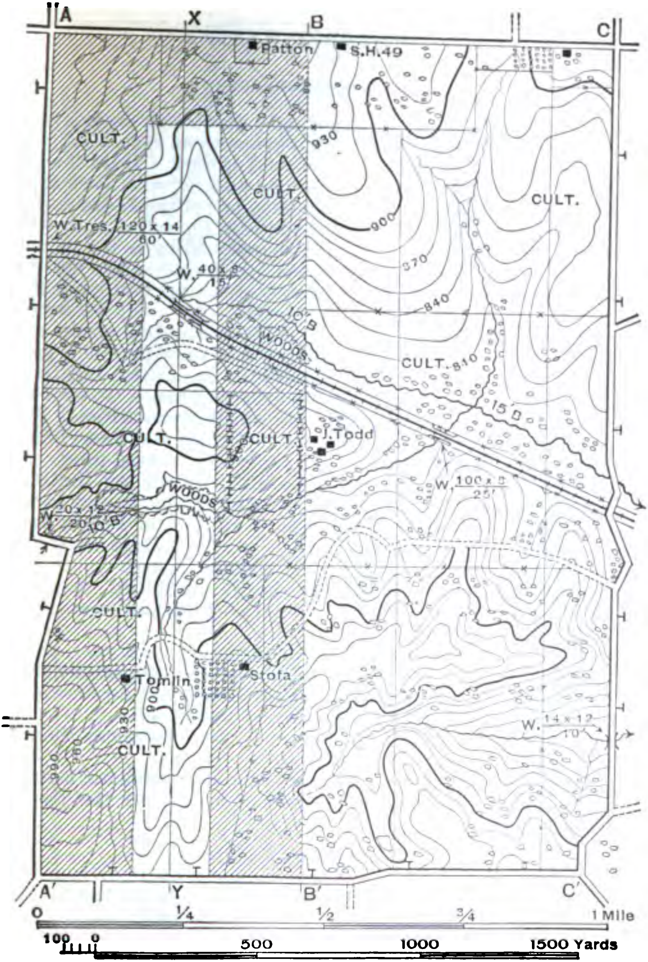
1401. The method employed in making a place sketch consists in occupying certain available positions within our own lines, and locating other positions which can not be occupied, by cross bearings or by bearings and estimation of distances.

A base line is established in the most practicable manner and this line with at least two good observing stations on the line are plotted to scale on the map.

All important points in the area are plotted from the observing stations and the work is completed by sketching in all necessary features as accurately as possible.

Considerable skill in map making is required to make a good place sketch.

The range card for attack, described in Art. 2145 (Fig. 166), is a type of rough place sketch.



Scale 4 Inches = 1 Mile (Before Reduction) V.I. 15 Feet

Position Sketch Executed by Military Methods

FIG. 126.

Landscape Sketching.

1402. The sketcher takes position at a point high enough to give him a comprehensive grasp of the landscape to be sketched.

He faces toward the middle of the field of view. Hold the board or sketch book vertically before the eye and move it backward or forward until the sheet just fills the field. Lower the board until the sky line of the hills can be seen above its top edge, and, with a pencil, mark on the edge the points corresponding to the principal salients and reentrants of the hill forms. If desirable, the board can be moved sideways far enough to enable the principal heights and depressions to be marked on the vertical edge. By intersecting references, the locations can then be easily established on the sheet. From these points the forms can be sketched in with much greater accuracy. Proceed next to draw the hills in outline, but faintly, with attention to the larger curves or humps at first. Go over them again with more care, bringing out the small irregularities. If any part of the horizon is visible, draw it in lightly and then complete the general mass of hills, by drawing the water or base lines. Seek now for the surface character of the hills, by tracing the ravine lines. The knobs and foothills are brought out by tracing the true meanders that show form. All changes in form or breaks in the ground produce corresponding breaks in the foliage of the tree masses, which show in the distance as irregular lines.

If the more important of these are sought and drawn, the general character of the hill will result. Add the foreground crest and the skeleton of the sketch is complete.

The road and railroad meanders should follow, as a rule, and the fences of the fields. Cultivated land is rendered by parallel, irregular lines. Houses, fortifications, trenches, etc., will be drawn more or less in detail according to distance and importance.

Enemies' lines of trenches, even at a great distance, should be strongly marked by simple black lines.

The indication of forests and trees is the most difficult feature.

A landscape sketch executed in accordance with the foregoing principles is shown in figure 127.

Sec. V.—MAP FINISHING.

1403. With regard to map making and sketching the following principles should be observed in their preparation:

(1) **Drawing.**—The essential requirements of a good topographical drawing are *accuracy* and *clearness*. By accuracy is meant a faithful

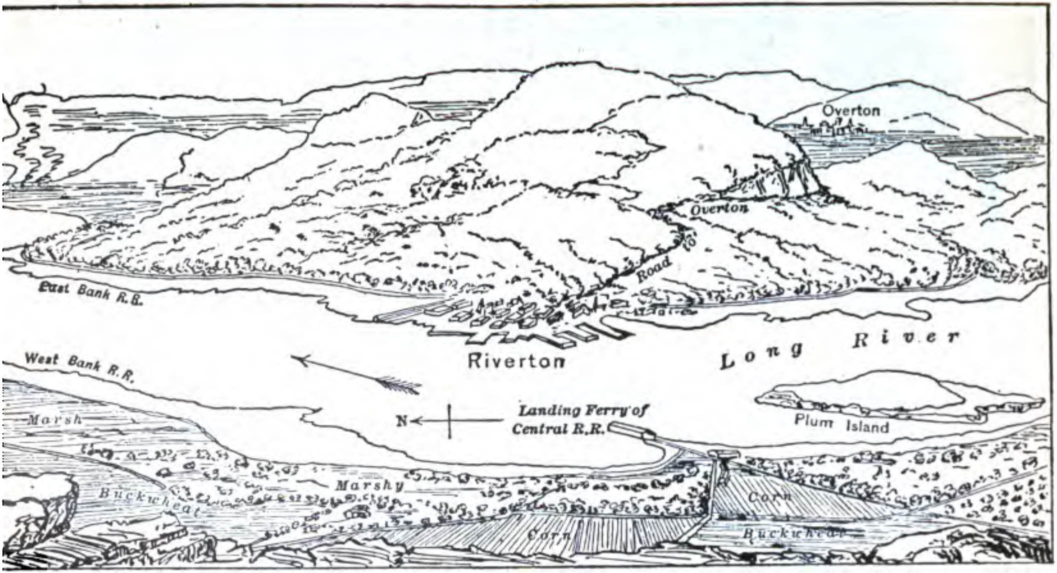

Overton
Overton
Road
East Bank R.R.
Riverton
Long River
West Bank R.R.
N
Landing Ferry of Central R.R.
Plum Island
Marsh
Marshy
Buckwheat
Corn
Corn
Buckwheat

FIG. 127.

exhibit of measurements and observations made in the field, or of data taken from other maps. Clearness involves absence of confusion or crowding, and neatness in execution. **Beauty and pictorial effect** are obtainable by skilled draftsmen only, and, while always desirable, are rarely necessary. Persons who are not skilled draftsmen should not attempt pictorial effect, as it will detract from accuracy and clearness without substituting any thing of equal value.

(2) **Avoid unnecessary haste** in plotting and drawing. If possible, take time to check carefully all azimuths and distances plotted and be sure they are exact. There should be no approximation on the drawing board. Although an observer may have simply guessed a distance to be 550 yards in the absence of other information, the plotter should be careful to lay it down at exactly 550 yards.

Start with clean paper and keep it as clean as possible. Wipe off the instruments before using, especially rulers, scales, and triangles. Dust the drawing carefully before beginning work. Dust again when stopping and cover with a cloth or paper. If necessary, dust the drawing and wash the hands occasionally while at work.

(3) **Make all ink lines firm and very black.** A drawing to be made in ink is usually drawn first in pencil, and in such cases a very hard pencil (4H or 6H) is best. If the pencil drawing is to be traced, a softer and blacker pencil should be used, but must be kept well pointed.

1404. Titles, notes, etc.—Every finished drawing should have descriptive title, consisting of—

(1) The designation of the organization under whose auspices it is made.

(2) Its kind, as **map, sketch, plot, plan, profile, section,** or **elevation.** If more than one kind of drawing appears on the sheet, each should be mentioned in the title.

(3) Its subject, if it relates to a particular object, feature, or purpose.

(4) Its locality. This and the preceding may be interchanged in position.

(5) Its sources, as **compiled from, etc.**; **reduced from, etc.**; **from a survey, etc.**

(6) Its authorship. If the work has been done by one person, acting under the instruction of another, both should be named.

(7) Its date.

(8) Its linear scale; its contour interval; and it may also have a scale of map distances.

1405. (1) **Notes.**—Besides the title, such information as will help to a proper understanding of the meaning and value of the map should be given in the form of notes. These usually relate to methods used in the survey, datum points, etc.

(2) **Meridian.**—The magnetic meridian should be shown, and the true meridian also if the declination is known. The true meridian may be a line, of 3 inches or upward in length, with a star at its north and the feather of the arrow at its south end. The magnetic meridian may be an arrow crossing the former at the middle point and making with it an angle equivalent to the declination.

(3) **Border.**—The drawing should be inclosed in a rectangle, preferably with its sides N. and S. and E. and W. The border consists of two parallel lines, the inner one medium fine, the outer one medium heavy, with a space between them equal to the width of the outer. For geographical maps a double border is used, with space between sufficient to contain the numbers of meridians and parallels.

Sec. VI.—RECONNAISSANCE DATA.

Reconnaissance of a Road.

1406. A road reconnaissance should procure data on the following subjects:

The road.—Gradients (slopes), especially the steepest; width of roadway; if paved, width, kind, and condition of paving; width and depth of side ditches, and whether wet or dry; if not paved, character of soil, sand, clay, or gravel; kind of fences and width between them. The sketch should also show where the road is in embankment or cutting; where wagons can not double or pass, and where foot troops can not march along the side between the wagon track and the fences.

Bridges.—Material of piers and abutments; type and material of superstructure, as girder, truss, arch, suspension, wood, steel, stone, etc.; width of roadway, clear headroom; safe load. Of bridges over the road, clear width and height; over streams, the nearest bridges above and below and whatever information can be obtained about them.

The country.—Character of cultivation or natural vegetation; areas and density of timber, underbrush, vines, especially poisonous ones; marshes and fords; kinds of fences; nature of soil; general configuration of surface, especially high hills, long ridges or valleys, bluffs or slopes too steep to scale, and practicable routes to their crests.

Streams crossed.—Name, width, depth, and surface velocity in swiftest current; velocity noted as sluggish, moderate, quick, or swift; elevation of high-water marks in relation to the road; which bank is the higher at crossing and above and below, and how much; accessibility of water for stock; fords at or near crossing; length, depth, and steepness of approaches; levees or embankments, height, and thickness on top; if navigable, to what distance above and below and for what class of vessels—steamers, flatboats, rowboats.

Towns and villages passed through.—Name, location on map, and population. Names of streets to be traversed. Material, as stone, brick, frame, log; size, 1, 2, 3, stories, and distribution, close or scattered, of the houses in those streets; gradients of intersecting streets; location of railway depots, post, telegraph, and telephone offices; of drinking fountains and watering troughs; of elevators, storehouses, or other accumulations of food or forage; of blacksmith, wagon, and machine shops.

When ordered to make a complete examination of a town or village, note besides the foregoing, location and size of principal buildings, halls, court and school houses, churches, banks, jails, and their ownership; sources, maximum quantity and distribution of water supply; sanitary conditions and disposal of wastes; location of railroads, depots, freight houses, sidings, etc.; for all roads entering from the surrounding country the same information as scheduled above for streets; location and extent of open spaces, and of large substantial buildings standing apart; location and extent of high ground within range, especially that from which streets can be enfiladed.

Railroads crossed.—Name, gauge, single or double track, sidings and loading platforms at point of crossing; crossing at grade, over or under; distance and name of nearest station each way; direction and distance of nearest roundhouse, shops, etc.

Reconnaissance of a River.

1407. River reconnaissance.—Designate the banks as right or left, the right bank being that on the right hand when looking down the stream. If, when standing on the bank facing across the stream, the current flows from left to right, the observer is on the right bank; if from right to left, he is on the left bank.

If the stream is navigated, pilots and residents will know distances by channel between landings with sufficient accuracy for the purposes of a field reconnaissance. In making a traverse along the banks of the river, it may be desirable to cross from one side to the other to save distance or avoid obstacles. When a crossing is to be made at two or three stations from the point of crossing select a point on the other side and take an azimuth to it. From the last station take another azimuth to the selected point, locating it by intersection. If the conditions prevent an intersection, take an azimuth from the last station to the point on the oppsoite bank and estimate the distance.

The valley.—General configuration, heights of limiting ranges, and positions of passes or roads crossing them; commanding ground from which a stretch of the channel of considerable length can be enfiladed by artillery; forest growth on or near banks; soil and cultivation of the valley; roads parallel to river, and means of access to them from the river.

The stream.—Its width, depth, and velocity; navigability, as for steamboats, flatboats, rowboats, rafts, and head of navigation for each; nature of obstructions to navigation and possibility of removing or avoiding them; season of high and low water; average rise and fall; rapidity of rise and fall and causes; amount of drift; character of banks and relative command. Quality of water; amount and kind of sediment borne; usual period and thickness of ice.

Tributaries and canals.—Width, depth, navigability, and means of crossing. Nature and purpose of canals; dimensions and lifts of locks; time for lockages; means of destroying locks and effect of destruction; floating plant found.

Bridges and fords.—As in road report. Also for bridges note position of the channel and navigable width between piers; height of arches and lower chords above the water at different stages; dimensions and operation of draw spans. Note the exact position of fords and the marks on both banks by which they may be found; length, width, and nature of bottom; velocity of current; position of deep holes; aids to crossing. Fords should not be more than 4 ft. 4 ins. for cavalry, 3½ ft. for infantry, and 2 ft. 4 ins. for guns and ammunition. Note nature of approaches to bridges and fords; width of roadway, slopes, soil, effect, of weather and traffic. Note especially the defensibility of bridges and fords.

Ferries, boats, and other means of crossing.—Position of ferries; approaches and practicability for horses and loaded wagons; sizes, number, and kinds of boats; method of propulsion; sites for military bridges or ferries; character of site for construction, use, and defense; proximity of islands and tributary streams; approaches and slope of banks; width of river and maximum surface velocity of current; materials for the construction or repair of boats, bridges, or ferries.

Inundations.—Places suitable for inundations by damming or obstructing a narrow bridge span, or by cutting a levee or dike. Note raised roads on ground liable to natural or artificial inundations and the safest route to follow by known landmarks when the road is overflowed. An extensive inundation 2 ft. deep on level ground is a serious obstacle unless the roads are very sound and marked by trees, posts, etc. Even when so marked a dip in the roadbed of 3 or 4 ft. may render the road impassable. A railroad bed is soon washed out even by a slight overflow.

Reconnaissance of a Railroad.

1408. Reconnaissance of a railroad—The line.—Local name; terminal points and distances between stations and other points; gauge; single or double track; condition of roadbed, ties, and rails; drainage and liability to overflows or washouts; facilities for repair; condition of right of way for marching troops along the line.

Tunnels and bridges.—Number and location; dimensions; strength of bridges; means of destroying and repairing; of blocking traffic.

Rolling stock.—Number and nature of engines and cars available; capacity for transporting troops between given points; facilities for constructing armored trains, as spare rails, old boilers, etc.; location and capacity of shops and store yards.

Stations.—Name and location; facilities for entraining and detraining troops with wagons and horses; platforms on through line and sidings; ramps; side tracks, number and capacity; turntables; water tanks; fuel supply; storage facilities; derricks or cranes; crossovers for teams and pedestrians. Facilities at hand for hospitals, camps, depots; for feeding men, heating coffee, watering horses during temporary halts.

Other communications.—Telegraph lines; number and location of stations; number of wires; connections; parallel highways, roads, rivers, or canals; means of access from same to railroad; junctions and crossings of other lines; relative elevation; facilities for laying temporary switches and sidings at stations or between crossing lines.

Defensibility.—Heights commanding line of road; defense of stations; defense of road and telegraph lines against raiding parties; structures exposed to demolition; defense and attack of same; defiles and river crossings.

Reconnaissance of a Wood.

1409. Reconnaissance of a wood or forest.—Note all roads and paths, and all hills, ravines, and streams within the wood or skirting the edges; kinds of trees, density and growth; underbrush, prevalence of poisonous shrubs and vines; marshy or large open spaces; practicability of forming new roads by cutting; creation of obstacles by felling trees; if there are no roads traverse the shortest practicable path between the point of entrance and point of exit, and mark boulders or blaze trees, set stakes, or otherwise indicate this path, and also give compass bearings of the route to be followed. Note the exterior forms of the woods, whether parts of the edge flank other parts; connection with neighboring pieces of wood by scattered trees or clearings; undulations of the ground that would give cover to attacking force or to defenders.

Reconnaissance of Mountains.

1410. Reconnaissance of mountains.—Note the number and positions of passes through the mountains, of roads and trails leading to these passes, their condition, practicability and means of repair; steepness of slopes on the sides of roads; means of constructing additional roads; watercourses and their direction, nature, and time of floods; means of crossing. Note ravines and open glades on mountain sides, lookout points and good signal stations; note time and duration of snowdrifts on roads or passes; depth of drifts and possibility of removing them or of traveling on the surface of the snow. Note extent and nature of forest growth.

Reconnaissance of a Position.

1411.—Reconnaissance of a position.—This problem usually includes the selection of the position, and is therefore tactical as well as topographical. Certain relations and conditions must be observed in the selection, and the extent and degree in which they are found must be clearly shown on the map or in the report.

The length of the position, or its development along the firing line, should be proportional to the force available for its occupation. Exact rules can not be given, but 5,000 infantry per mile or 3 men per yard is the usual estimate.

The **flanks must be secure.**—Impassable natural features, a river, mountain, or stream form the best flank. Lacking these, a wood, a deep ravine, a cliff, or a high hill will serve. Even with these features absent a flank may be strengthened by the construction of a strong earthwork, but the general rule obtains that natural weakness of the flanks must be made up by a greater number of men, or by the substitution of cavalry for infantry in case the ground favors the movements of mounted troops.

If the **flanks are naturally strong** the line should be withdrawn to make the entire position reentrant; if the **flanks are naturally weak** the connecting line should be held straight or advanced so as to make the position straight or salient.

Reconnaissance for a Camp.

1412.—Reconnaissance for a camp or winter quarters—Site.—Location, elevation, and area; sanitary features, such as drainage, dryness, and general character of top soil; proximity of swampy ground or stagnant ponds.

Communications.—Sufficiency of existing roads and paths, maximum grades. probable condition under heavy traffic and in bad weather, location and kind of materials available for improvement or repair, railroad or water communication and terminal facilities of same.

Water and fuel.—Location, kind, and quantity of fuel at hand; quality and quantity of water; facilities for filling water carts, for watering animals, and for washing and bathing; nature of supply, as wells, springs, running streams, and its reliability.

Shelter and conveniences.—Proximity of trees, brush, wood, hay, and straw for huts and bedding; of markets; of towns and villages.

Defensibility.—Location of outposts and guards; location and character of defensive positions in or near the camp; force required to hold positions which may command the camp.

PART II.

DRILL REGULATIONS.

DEFINITIONS.

Accessory defenses: Wire entanglements, land mines, *chevaux-de-frise*, traps, and other obstacles constituting the passive elements of defense.

Accompanying weapons: One-pounders, light mortars, and artillery pieces attached to infantry battalions for an attack.

Alignment: A straight line upon which several elements are formed, or are to be formed; or the dressing of several elements upon a straight line.

Approach trench: A trench serving to connect fire trenches or an intrenched area with the rear.

Base: The element on which a movement is regulated.

Battle sight: The position of the rear sight when the leaf is laid down.

Center: The middle point or element of a command.

Column: A formation in which the elements are placed one behind another.

Containing action (or **holding attack**): An attack designed to hold the enemy to his positions, and prevent him from withdrawing a portion of his forces and employing them elsewhere.

Cover trench: A trench designed primarily solely for the purpose of affording cover from hostile fire.

Demonstration: An attack delivered on a front where a decision is not sought and made with the object of deceiving the enemy as to the point of decisive action.

Deploy: To extend the front. In general, to change from column to line, or from close order to extended order.

Depth: The space from head to rear of any formation or of a position, including the leading and rear elements. The depth of a man is assumed to be 12 inches.

Distance: Space between elements in the direction of depth. Distance is measured from the back of the man in front to the breast of the man in rear. The distance between ranks is 40 inches in both line and column.

Echelon: One of a series of elements formed one behind the other. Also a modification of a line formation in which the elements on one or both flanks are disposed to the rear of those on their right or left.

Echelonment: Act of retiring the flank elements of a line.

Element: A file, squad, platoon, company, or larger body, forming part of a still larger body.

File: Two men, the front-rank man and the corresponding man of the rear rank. The front-rank man is the **file leader**. A file which has no rear-rank man is a **blank file**. The term **file** applies also to a single man in a single-rank formation.

File closers: Such officers and petty officers of a company as are posted in rear of the line. For convenience, all men posted in the line of file closers.

Firing trench: A trench designed and constructed so as to facilitate the delivery of fire.

Flank: The right or left of a command in line or in column or the element on the right or left of the line. Also the side of a force or a position in the direction of depth.

Formation: Arrangement of the elements of a command. The placing of all fractions in their order in line, in column, or for battle.

Front: The direction of the enemy. When a combat situation does not exist or is not assumed, the front is the direction toward which the command is faced. Also the side of a force or position toward the enemy.

Frontage: The space occupied by an element measured from one flank to the opposite flank. The frontage of a man is assumed to be 22 inches.

Guide: An officer, petty officer, or private upon which the command or elements thereof regulates its march.

Head: The leading element of a column.

Interval: Space between elements of the same line. The interval between men in ranks is 4 inches and is measured from elbow to elbow. Between companies, squads, etc., it is measured from the left elbow of the left man or guide of the group on the right to the right elbow of the right man or guide of the group on the left.

Left: The left extremity or element of a body of troops.

Line: A formation in which the different elements are abreast of each other.

Order, close: The formation in which the units, in double rank, are arranged in line or in column with normal intervals and distances.

Order, extended: The formation in which the units are separated by intervals greater than in close order.

Pace: Thirty inches; the length of the full step in quick time.

Petty officer, chief: A petty officer (normally a chief petty officer or petty officer 1st class), to perform the duties of the first sergeant of a company.

Petty officer, first: A petty officer (normally a petty officer 1st or 2nd class) to perform the duties of a sergeant.

Petty officer, second: A petty officer (normally a petty officer 2nd or 3d class), to perform the duties of a corporal.

Point of rest: The point at which a formation begins. Specifically, the point toward which units are aligned in successive movements.

Rank: A line of men placed side by side.

Right: The right extremity or element of a body of troops.

Support platoons: The platoons of the company used as a support to the assaulting platoons.

Wave: One of a series of lines of skirmishers or small columns into which an attacking unit is deployed.

INTRODUCTION.

1413. Success in battle is the ultimate object of all military training; success may be looked for only when the training is intelligent and thorough.

1414. Commanding officers are accountable for the proper training of their respective organizations within the limits prescribed by regulations and orders.

The excellence of an organization is judged by its field efficiency. The field efficiency of an organization depends primarily upon its effectiveness as a whole. Thoroughness and uniformity in the training of the units of an organization are indispensible to the efficiency of the whole; it is by such means alone that the requisite teamwork may be developed.

1415. Simple movements and elastic formations are essential to correct training for battle.

1416. The Drill Regulations are furnished as a guide. They provide the principles for training and for increasing the probability of success in battle.

In the interpretation of the regulations, the spirit must be sought. Quibbling over the minutiæ of form is indicative of failure to grasp the spirit.

1417. The principles of combat are considered in Part I, chapters IV and V of these regulations. They are treated in the various schools included in Part II only to the extent necessary to indicate the functions of the various commanders and the division of responsibility between them. The amplification necessary to a proper understanding of their application is to be sought in Part I.

1418. The following important distinctions must be observed:

(*a*) Drills executed at **attention** and the ceremonies are **disciplinary exercises** designed to teach precise and soldierly movement, and to inculcate that prompt and subconscious obedience which is essential to proper military control. To this end, smartness and precision should be exacted in the execution of every detail. Such drills should be frequent, but short.

(*b*) The purpose of **extended order drill** is to teach the **mechanism** of deployment, of the firings, and, in general, of the employment of troops in combat. Such drills are in the nature of disciplinary exercises and should be frequent, thorough, and exact in order to habituate men to the firm control of their leaders. Extended order drill is executed **at ease.** The platoon is the largest unit which executes extended order drill.

(*c*) **Field exercises** are for instruction in the duties incident to campaign. Assumed situations are employed. Each exercise should conclude with a discussion, on the ground, of the exercise and principles involved.

(*d*) The **combat exercise, a form of field exercise** of the platoon, company, battalion, and larger units, consists of the **application of tactical principles** to assumed situations, employing in the execution the appropriate formations and movements of close and extended order.

Combat exercises must simulate, as far as possible, the battle conditions assumed. In order to familiarize both officers and men with such conditions, platoons, companies, and battalions will frequently be consolidated to provide war-strength organizations. Officers and p. os. not required to complete the full quota of the units participating are assigned as observers or umpires.

The firing line can rarely be controlled by the voice alone; thorough training to insure the proper use of prescribed signals is necessary.

The exercise should be followed by a brief drill at attention in order to restore smartness and control.

1419. In field exercises the enemy is said to be **imaginary** when his position and force are merely assumed; **outlined** when his position and force are indicated by a few men; **represented** when a body of troops acts as such.

General Rules for Drills and Formations.

1420. When the **preparatory** command consists of more than one part, its elements are arranged as follows:

(1) For movements to be executed successively by the subdivisions or elements of an organization: (*a*) Description of the movement; (*b*) how executed, or on what element executed.

(2) For movements to be executed simultaneously by the subdivisions of an organization: (*a*) The designation of the subdivisions; (*b*) the movement to be executed.

1421. Movements that may be executed toward either flank are explained as toward but one flank, it being necessary to substitute the word "left" for "right" and the reverse, to have the explanation of the corresponding movement toward the other flank. The commands are given for the execution of the movements toward either flank. The substitute word of the command is placed within parentheses.

1422. Any movement may be executed either from the halt or when marching, unless otherwise prescribed. If at a halt, the command for movements involving marching need not be prefaced by **forward**, as 1. **Column right** (**left**), 2. **MARCH.**

1423. Any movement not specially excepted may be executed in double time.

If at halt, or if marching in quick time, the command **double time** precedes the command of execution.

1424. In successive movements executed in double time the leading or base unit marches in **quick time** when not otherwise prescribed; the other units march in **double time** to their places in the formation ordered and then conform to the gait of the leading base unit. If marching in double time, the command **double time** is omitted. The leading or base unit marches in **quick time**; the other units continue at double time to their places in the formation ordered and then conform to the gait of the leading or base unit.

1425. To hasten the execution of a movement begun in quick time, the command: 1. **Double time,** 2. **MARCH,** is given. The leading or base unit continues to march in quick time, or remains at halt if already halted; the other units complete the execution of the movement in double time and then conform to the gait of the leading or base unit.

1426. To stay the execution of a movement when marching, for the correction of errors, the command: 1. **In place,** 2. **HALT**, is given. All halt and stand fast, without changing the position of the pieces. To resume the movement the command: 1. **Resume,** 2. **MARCH**, is given.

1427. To revoke a preparatory command, or, being at a halt, to begin anew a movement improperly begun, the command, **AS YOU WERE**, is given, at which the movement ceases and the former position is resumed.

1428. Unless otherwise announced, the guide of a platoon or subdivision of a company in line is **right**; of a company in line or line of subdivisions or of a deployed line, **center**; of a rank in column of squads, toward the side of the guide of the column.

To march with guide other than as prescribed above, or to change the guide: **Guide (right, left,** or **center**).

In successive formations into line, the guide is toward the point of rest; in platoons or larger subdivisions it is so announced.

The announcement of the guide, when given in connection with a movement, follows the command of execution for that movement.

1429. The turn on the fixed pivot by subdivisions is used in all formations from line into column and the reverse.

The turn on the moving pivot is used by subdivisions of a column in executing changes of direction.

1430. Partial changes of direction may be executed:

By interpolating in the preparatory command the word **half**, as **Column half right** (**left**), or **Right** (**left**) **half turn**. A change of direction of 45° is executed.

By the command: **INCLINE TO THE RIGHT** (**LEFT**), the guide or guiding element moves in the indicated direction and the remainder of the command conforms. This movement effects slight changes of direction.

1431. The designations **line of sections, line of platoons, line of companies, line of battalions,** etc., refer to the formations in which the sections, platoons, companies, battalions, etc., each in column of squads, are in line.

1432. Full distance in column of subdivisions is such that in forming line to the right or left the subdivisions will have their proper intervals.

In column of subdivisions the guide of the leading subdivision is charged with the step and direction; the guides in rear preserve the trace, step, and distance.

1433. In close order, all details, detachments, and other bodies of troops are habitually formed in double rank.

To insure uniformity of interval between files when falling in, and in alignments, each man places the palm of the left hand upon the hip, fingers pointing downward. In the first case the hand is dropped by the side when the next man on the left has his interval; in the second case, at the command **FRONT**.

1434. The posts of officers, p. os., special units (such as band or machine-gun company), details, etc., in the various formations of the platoon, company, battalion, or regiment, are shown in plates, and described in the articles referring thereto.

In all changes from one formation to another involving a change of post on the part of any of these, posts are promptly taken by the most convenient route as soon as practicable after the command of execution for the movement; officers and p. os. who have prescribed duties in connection with the movement ordered, take their new posts when such duties are completed.

As instructors, officers and p. os. go wherever their presence is necessary. As file closers it is their duty to rectify mistakes and insure steadiness and promptness in the ranks.

1435. Except at ceremonies, the special units have no fixed places. They take places as directed; in the absence of directions, they conform as nearly as practicable to the plates, and in subsequent movements maintain their relative positions with respect to the flank or end of the command on which they were originally posted.

1436. General, field, and staff officers may be mounted when conditions permit. Their posts when mounted are the same as when dismounted. The staff of an officer forms in single rank 3 paces in rear of him, the right of the rank extending 1 pace to the right of a point directly in rear of him. Members of the staff are arranged in order from right to left as follows: General staff officers, adjutant, aids, other staff officers, arranged in each classification in order of rank, the senior on the right. The flag of the general officer and the orderlies are 3 paces in rear of the staff, the flag on the right. When necessary to reduce the front of the staff and orderlies, each line executes **twos right** or **fours right**, and follows the commander.

When not otherwise prescribed, staff officers draw and return sword with their chief.

1437. In making the about, an officer, mounted, habitually turns to the left.

When the commander faces to give commands, the staff, flag, and orderlies do not change position.

1438. When making or receiving official reports, or on meeting out of doors, all officers will salute.

Military courtesy requires the junior to salute first, but when the salute is introductory to a report made at a military ceremony or formation, to the representative of a common superior (as, for example, to the adjutant, officer of the day, etc.), the officer making the report, whatever his rank, will salute first; the officer to whom the report is made will acknowledge by saluting that he has received and understood the report. (See Art. 2240 et seq.)

1439. For ceremonies, all mounted enlisted men of a regiment or smaller unit, except those belonging to the machine-gun organizations, are consolidated into a detachment; the senior present commands if no officer is in charge. The detachment is formed as a platoon or squad of cavalry in line or column of fours; staff p. os. are on the right or in the leading ranks.

1440. For ceremonies, such of the staff p. os. as are dismounted are formed 5 paces in rear of the color, in order of rank from right to left. In column of squads they march as file closers.

1441. Other than for ceremonies, staff p. os. and orderlies accompany their immediate chiefs unless otherwise directed. If mounted, the staff p. os. are ordinarily posted on the right or at the head of the orderlies.

1442. In all formations and movements a p. o. commanding a platoon or company carries his piece as the men do, if he is so armed, and takes the same post as an officer in like situation. When the platoon is formed in line for ceremonies, a p. o. command takes post on the right of the right guide after the platoon has been aligned.

CHAPTER I.

INFANTRY WEAPONS.

Sec. I.—RIFLE AND BAYONET.

1443. In spite of the addition of numerous auxiliary weapons to infantry units, the rifle is by far the most formidable weapon of the infantry soldier. Effective rifle fire is essential to victory and is the element which most frequently determines the issue of battle.

As opposed to automatic weapons, the rifle is primarily the infantry weapon for frontal fire and for use against distributed targets.

1444. Training in bayonet fighting has its chief value as a factor in the development of the offensive spirit. Every infantryman must be trained to such a point that he has full confidence in his ability personally to overcome his adversary in hand-to-hand combat.

Training in rifle practice is conducted as prescribed in the Small Arms Firing Manual. Training in bayonet fighting is governed by the provisions of the Bayonet Manual.

Automatic Rifle.

1445. The automatic rifle is a rifle that fires infantry ammunition on the automatic principle and in which the recoil is supported by the body of the firer.

Its principal characteristics are as follows:

(1) It can act only by means of fire. It can not therefore make an enemy give up an intrenched line. The power of driving an enemy from trenches belongs preeminently to the bayonet and the grenade.

(2) Rapid production of a large volume of concentrated fire. The greatest value is therefore obtained from its fire when it is delivered in a flanking direction.

(3) Narrow front and shallow depth from which a large volume of fire can be delivered by a few men.

This characteristic enables the automatic rifle to meet an attack from any direction with little or no movement or exposure. A sudden attack from the flank can be dealt with at once. This indicates the usefulness of the automatic rifle on a flank, in a detached post, in a salient, or for engaging in an enveloping attack; it can carry out these missions without increasing its vulnerability to enfilade fire as would be the case with riflemen if a number of rifles sufficient to produce the same fire effect were employed for the same purpose. In this way, it also enables an infantry unit to meet an attack on its flank without change of formation.

(4) Invulnerability. An automatic rifle in action offers a small target, is difficult to locate, and still more difficult to hit. It occupies one twenty-fifth of the frontage of 25 riflemen and delivers the same volume of fire. Invulnerability depends largely on invisibility. On the defensive, automatic rifles are therefore preferably placed outside of fire and communicating trenches, and their firing position is frequently changed.

(5) Mobility. Its mobillty is the same as that of the rifleman and is superior to that of the machine gun. It is therefore preeminently the automatic weapon for use in the offensive by the assaulting waves.

In certain very restricted cases, fire can be delivered while advancing. Marching fire is, however, practicable only against a clearly defined line at ranges less than 200 yards. Such targets may be obtained in position warfare, but the use of marching fire in open operations will be unusual. Marching fire may sometimes be employed to advantage to cover a methodical advance through dense woods.

(6) Its dispersion is less than that of an equal volume of rifle fire. Accuracy of range estimation is therefore of relatively greater importance.

Due to vibration and other causes, the dispersion of the weapon when fired automatically, is, however, greater than that of a single rifle. When used as a semi-automatic (single-shot) weapon, its dispersion is practically the same as that of the rifle. Except when an unusually favorable target offers and at critical periods of combat where a large volume of fire is required, semi-automatic action should be used.

(7) Unsuitability for indirect or overhead fire. This class of fire is a function of the machine gun.

1446. In the offensive, automatic rifles should be used by covering detachments in the combats necessary to develop the enemy's position in the earlier stages of the fight and by the assaulting units to gain fire superiority in the later stages. Patrols of more than three men should habitually include an automatic rifle. Outguards should always have an automatic rifle. These results can best be obtained by making the autorifleman a permanent member of each infantry squad.

On the defensive, automatic rifles are used for flanking or covering the probable avenues of approach that can not be covered by machine guns. In the main line of resistance, they are used to supplement the fire of machine guns; by reason of their superior mobility, they are used in preference to machine guns in advance of the line of resistance of the outpost zone.

Machine Guns.

1447. The machine gun is a weapon that fires infantry ammunition on the automatic principle and in which the recoil is supported by some sort of fixed mount and the direction of fire is capable of being clamped.

The machine gun possesses all of the characteristics of the automatic rifle except mobility, and in addition that of a fixed mount and capacity for sustained fire for long continued periods. The fixed mount eliminates errors in holding, permits of the concentration of fire by close grouping, increases the safety of overhead fire and effect at long ranges, and permits of the accurate observation of fire effect. The machine gun is therefore especially adapted to the purposes of long-range fire, where range estimation is uncertain and the strike of rifle bullets can seldom be observed. The fixed mount also increases the adaptability of the weapon for night firing as it enables the gun to be laid by day and used by night for commanding avenues of approach, sweeping parapets, and enfilading a definite line. The fixed rest decreases the dispersion but requires a more accurate determination of the range.

By virtue of its capacity for sustained fire for long continued periods, the machine gun is preeminently the automatic weapon for use in the defense, where the ammunition supply is practically unlimited.

In respect to mobility, the machine gun is inferior to the automatic rifle. It can, however, go anywhere a man on foot can go, though at a slightly slower rate, and can thus support infantry on any kind of terrain. Machine guns are therefore particularly valuable as a mobile reserve to strengthen threatened points, fill gaps, and meet unexpected situations.

The liability to accidental cessation of fire requires machine guns generally to operate in pairs.

The noise and flash of discharge facilitate the location of the gun and draw hostile artillery fire. In defense, alternative positions should therefore be selected.

Sec. II.—GRENADES.

1448. The grenade is a weapon used by the infantry soldier as a supplement to his primary weapon, the rifle and bayonet. Training in the use of grenades is to be regarded as supplementary and subsidiary to training in rifle practice. Men will not be especially designated nor exclusively employed as bombers or rifle grenadiers.

Hand Grenades.

(Ordnance pamphlet No. 52.)

1449. The characteristics of the hand grenade are:

(1) Curved trajectory. This quality indicates its principal function as a weapon to kill the enemy sheltered behind cover or under ground or to force him into the open where he will become a target for the rifle and machine gun.

(2) An effective rate under favorable conditions of 10 grenades per minute. This enables a few men to put down an almost impassable barrage on dead ground.

(3) A radius of action varying from 20 to 100 yards, depending on the type of the grenade. The short range of the grenade prevents the use in open warfare of grenades having a large radius of action.

(4) Relatively considerable weight of the projectile, limiting the number which can be carried by the soldier and thereby diminishing its value as an offensive weapon, except for operations involving a slight advance. The difficulty of supply largely disappears in the defense.

(5) Short range; an average effective range of from 30 to 40 yards may be reckoned on. It is therefore of limited value in the attack against machine guns and other open-warfare objectives; in position warfare where there is often dead ground at close range of the objec-

tive it is useful in cleaning up trenches, assisting in the advance through the enemy's trench system, and in village fighting.

(6) Capability of application as an agency for creating a smoke screen. When so used, special types of grenades may be used to conceal troop movements by creating a frontal or flank screen.

(7) Adaptability for use as a vehicle for lachrimatory or irritating gases which can be employed to render dugouts untenable.

(8) Incendiary effect (special types).

In general, the characteristics of the hand grenade indicate its use as a weapon for defense, for minor attacks and raids, and for cleaning up in the preliminary stages of an offensive in position warfare.

Rifle Grenade.

(Ordnance pamphlet No. 53.)

1450. The powers and limitations of the rifle grenade are the same as those of the hand grenade except in respect to the following:

(1) Range. The rifle grenade can be fired at ranges of from 30 to 200 yards. It is thus capable of extending the radius of action of the hand grenade. Its increased range makes it of value in open warfare for combating machine-gun nests and strong points and in covering the advance of assaulting troops. Due to the inferior limit of its range, it can not replace the hand grenade in hand-to-hand combat in trenches.

(2) Adaptability to fire from a fixed rest. Due to this property, which enables the fire to be accurately registered, it is preeminently adapted for the purposes of harassing fire in position warfare on objectives such as sentry posts, exits of shelters, enemy assembly points for attack, junctions of communicating trenches.

(3) Considerable weight, rendering supply difficult in offensive operations and requiring great economy in expenditure.

Two types of rifle grenades are used—high explosive and phosphorous.

For further information see Manual for Hand Bombers and Rifle Grenadiers, confidential Army publications.

Sec. III.—ONE-POUNDER GUN.

1451. The characteristics of the one-pounder gun are:

(1) Its mobility and the small space required for its ammunition, which allow it to follow the infantry in any phase of combat.

(2) The ease with which it can be hidden behind a parapet or sunk into the soil.

(3) Ability to deliver masked fire.

(4) The great ease with which it is adjusted and regulated.

(5) Its great accuracy, which allows it to make direct hits upon embrasures up to 1,200 meters and gives it a useful range of 1,500 meters.

(6) The rapidity of its fire, which, during a short burst, may attain a rate of 20 rounds per minute.

(7) Great visibility of flash of discharge, which permits its location to be easily determined, especially at night, unless proper measures are taken for concealing it. It is always advisable to prepare a number of masked positions which enable the gun to avoid registration by the hostile artillery.

1452. Its percussion, high-explosive shell is used against troops and matériel, its steel shell against armor. It has little effect against earth shelters. It is primarily designed to destroy by direct fire any machine gun which can be definitely located. For this purpose, it is the most efficient single weapon in the infantry regiment. It is also an effective antitank gun.

Light Mortar.

(Ordnance pamphlet No. 123.)

1453. The principal characteristics of the light mortar are:

(1) Limiting ranges of 100 and 1,800 yards. Its most effective range is obtained when the piece is fired at an angle of 45 degrees. The effective range of the mortar indicates its employment in close support of the infantry. On the defensive in position warfare, its weakness when thus employed lies in the fact that the area in which it is emplaced will be constantly subjected to a heavy artillery fire. By carefully noting the normal methods of fire employed by the enemy, it will, however, usually be found possible to avoid hostile fire effect and employ the mortars effectively. They should not, as a rule, be employed close to the front line but should rather be distributed, like the machine guns, over the whole battle area within their range so as to be able to fire to the front and also against as many points as possible in our own positions.

Due to their closer proximity to the infantry engaged in the same battle sector, the light mortars are often better able to adapt themselves to any momentary changes in the struggle and to take quicker advantage of favorable opportunities than the artillery posted at a great distance to the rear. In position warfare they are indispensable in the preparation and support of our own minor operations and for the repulse of hostile operations.

(2) Considerable radius of action as compared with the 1-pounder gun. Due to this quality, it is used in preference to the latter against targets, such as concealed machine guns, which can not be definitely located.

(3) Dispersion less than that of the field gun. It can therefore engage targets which are too close to our own lines to be destroyed by artillery.

(4) Curved trajectory. It is theretore adapted to fire against targets on reverse slopes or under cover. For this purpose it will often prove more effective than artillery.

(5) Considerable weight of ammunition. This quality lessens its value in mobile operations and requires that great economy in the expenditure of ammunition be practiced during such operations and that the system of supply be carefully organized.

(6) Great rapidity of fire. This quality renders the light mortar particularly valuable for barrage and annihilating fire in position warfare where abundant ammunition is available. In mobile operations, the rapidity of fire of the light mortar is to a great extent neutralized by the difficulty of ammunition supply.

(7) Capability of being accurately registered on objectives within the enemy's line. It is therefore adapted to the purposes of harassing fire in position warfare.

The light mortar fires two types of shell—high explosive and phosphorous.

CHAPTER II.

ORDERS, COMMANDS, AND SIGNALS.

1454. Commands only are employed in drill at attention. Otherwise either a **command**, **signal**, or **order** is employed, as best suits the occasion, or one may be used in conjunction with another.

1455. Signals should be freely used in instruction, in order that officers and men may readily know them. In making arm signals the sword, rifle, or headdress may be held in the hand.

1456. Officers and men fix their attention at the first word of command, the first note of the bugle or whistle, or the first motion of the signal. A signal includes both the preparatory command and the command of execution; the movement commences as soon as the signal is understood, unless otherwise prescribed.

1457. Except in movements executed at **attention**, commanders or leaders of subdivisions repeat orders, commands, or signals whenever such repetition is deemed necessary to insure prompt and correct execution.

In extended order, during real or simulated firings, squad leaders, and if necessary individual men, transmit orders by word of mouth along the skirmish line, always stating the source of the order. Transmission of orders by this means requires especial training.

Officers, bn. staff n. os., platoon leaders, guides, and musicians are equipped with whistles.

The bn. c. and his staff will use a whistle of distinctive tone; the c. c. and company musicians a second and distinctive whistle; the platoon leaders and guides a third distinctive whistle.

1458. Prescribed signals are limited to such as are essential as a substitute for the voice under conditions which render the voice inadequate.

Before or during an engagement special signals may be agreed upon to facilitate the solution of such special difficulties as the particular situation is likely to develop, but it must be remembered that simplicity and certainty are indispensable qualities of a signal.

Orders.

1459. In these regulations an **order** embraces instructions or directions given orally or in writing in terms suited to the particular occasion and not prescribed herein.

Orders are employed only when the **commands** prescribed herein do not sufficiently indicate the will of the commander.

(Orders are more fully described in art. 584 et seq.).

Commands.

1460. In these regulations a **command** is the will of the commander expressed in the phraseology prescribed herein.

1461. There are two kinds of commands:

The **preparatory** command, such as **forward**, indicates the movement that is to be executed.

The command of **execution**, such as **MARCH**, **HALT**, or **ARMS**, causes the execution.

Preparatory commands are distinguished by **bold face**, those of **execution** by **CAPITALS**.

Where it is not mentioned in the text who gives the commands prescribed, they are to be given by the commander of the unit concerned.

The **preparatory** command should be given at such an interval of time before the command of **execution** as to admit of being properly understood; the command of **execution** should be given at the instant the movement is to commence.

The tone of command is animated, distinct, and of a loudness proportioned to the number of men for whom it is intended.

Each **preparatory** command is enunciated distinctly, with a rising inflection at the end, and in such manner that the command of **execution** may be more energetic.

The command of **execution** is firm in tone and brief.

1462. C. c. and commanders of units larger than a company repeat such commands of their superiors as are to be executed by their units, facing their units for that purpose. The company is the largest unit that executes a movement at the command of execution of its commander, except that at ceremonies and inspections the battalion executes movements at the command of execution of its commander or adjutant.

1463. When giving commands to troops it is usually best to face toward them.

Indifference in giving commands must be avoided, as it leads to laxity in execution. Commands should be given with spirit at all times.

Bugle Signals.

1464. The authorized bugle signals are published in Part II, Chap. XII, Nos. 27 to 37, inclusive.

The following bugle signals may be used off the battle field, when not likely to convey information to the enemy:

Attention: Troops are brought to attention.

Attention to orders: Troops fix their attention.

Forward, march: Used also to execute quick time from double time.

Double time, march.

To the rear, march: In close order, execute **squads right about.**

Halt.

Assemble, march.

The following bugle signals may be used on the battle field:

Fix bayonets.

Charge.

Assemble, march.

These signals are used only when intended for the entire firing line; hence they can be authorized only by the commander of a unit (for example, a regiment or brigade) which occupies a distinct section of the battle field. Exception: **Fix bayonet.**

The following bugle signals are used in exceptional cases on the battle field. Their principal uses are in field exercises and practice firing.

Commence firing: Officers charged with fire direction and control open fire as soon as practicable. When given to a firing line, the signal is equivalent to **fire at will.**

Cease firing: All parts of the line execute **cease firing** at once.

These signals are not used by units smaller than a regiment, except when such unit is independent or detached from its regiment.

Whistle Signals.

1465. Attention to orders.—A **short blast** of the whistle. This signal is used on the march or in combat when necessary to fix the attention of troops, or of their commanders or leaders, preparatory to giving commands, orders, or signals.

When the firing line is firing, each squad leader suspends firing and fixes his attention at a short blast of his platoon or section leader's whistle. The platoon or section leader's subsequent commands or signals are repeated and enforced by the squad leader. If a squad leader's attention is attracted by a whistle other than that of his platoon leader, or if there are no orders or commands to convey to his squad he resumes firing at once.

Suspend firing. A long blast of the whistle.

All other whistle signals are prohibited.

Arm Signals.

1466. The following arm signals are prescribed. In making signals, either arm may be used. Officers who receive signals on the firing line "repeat back" at once to prevent misunderstanding.

Forward, march; By the right (left) flank, march; To the rear, march. Face and move in the direction of march; at the same time extend the arm vertically to its full extent and lower it to the front (flank, rear) until horizontal.

Quick time, march. Raise the right elbow to a position above and to the right of the right shoulder; extend the forearm to the left, right hand above the head.

Halt. Carry the hand to the shoulder; thrust the hand upward and hold the arm vertically.

Lie down (or take cover). Turn toward the skirmishers and raise the hand in front of the elbow, fore arm horizontal; thrust the hand downward several times, palm toward the ground.

Double time, march or rush. Carry the hand to the shoulder; rapidly thrust the hand upward the full extent of the arm several times.

Change direction. The hand on the side toward which the change of direction is to be made is carried across the body to the opposite shoulder, forearm horizontal; then swing in a horizontal plane, arm extended, pointing in the new direction.

As skirmishers, march. Raise both arms laterally until horizontal. If necessary, lower the arm in the direction of march after completion of signal as in forward march, etc.

As skirmishers, right (left), march. Raise both arms laterally until horizontal; swing the arm on the side toward which the deployment is to be made, upward until vertical and return it to the horizontal; repeat several times; hold the other arm steadily in the horizontal position.

Assemble, march. Raise the arm vertically to its full extent and describe large horizontal circles.

Range, or change elevation. To announce range, extend the arm toward the leaders or men for whom the signal is intended, fist closed; by keeping the fist closed battle sight is indicated; open the fist once for 500 yards, twice for 1,000 yards, etc., and thrust the fist upward once for each additional 100 yards; to add 50 yards describe a short horizontal line with the forefinger. To change elevation, indicate the complete new range.

Are you ready? or I am ready. Raise the hand, fingers extended and joined, palm toward the person addressed.

Commence firing. Move the arm extended in full length, hand palm down, several times, through a horizontal arc in front of the body.

Fire faster. Execute rapidly the signal "Commence firing."

Fire slower. Execute slowly the signal "Commence firing."

To indicate a new target. Extend the arm in full length to the front, palm to the right (left); swing the arm to right (left), and point in the direction of the new target.

Fix bayonet. Simulate the movement of the right hand in "Fix bayonet."

Suspend firing. Raise and hold the forearm steadily in a horizontal position in front of the forehead, palm of the hand to the front.

Cease firing. Raise the forearm as in suspend firing and swing it up and down several times in front of the face.

Section. Extend the arm horizontally toward the section leader; describe large circles with the entire arm.

Squad. Extend the arm horizontally toward the section leader; swing the hand up and down from the wrist.

1467. The signals, section and squad, are intended primarily for communication between the platoon leader and his section leaders. The signal section or squad indicates that the section leader is to cause the signal which follows to be executed by section or squad.

1468. The following described signal flags are carried in the field by the company musicians in the United States Army, and their use is authorized as appropriate.

First battalion:
    First company. Red field, white square.
    Second company. Red field, blue square.
    Third company. Red field, white diagonal cross.
    Fourth company. Red field, blue diagonal cross.
Second battalion:
    Fifth company. White field, red square.
    Sixth company. White field, blue square.
    Seventh company. White field, red diagonal cross.
    Eighth company. White field, blue diagonal cross.

Third battalion:
Ninth company. Blue field, red square.
Tenth company. Blue field, white square.
Eleventh company. Blue field, red diagonal cross.
Twelfth company. Blue field, white diagonal cross.

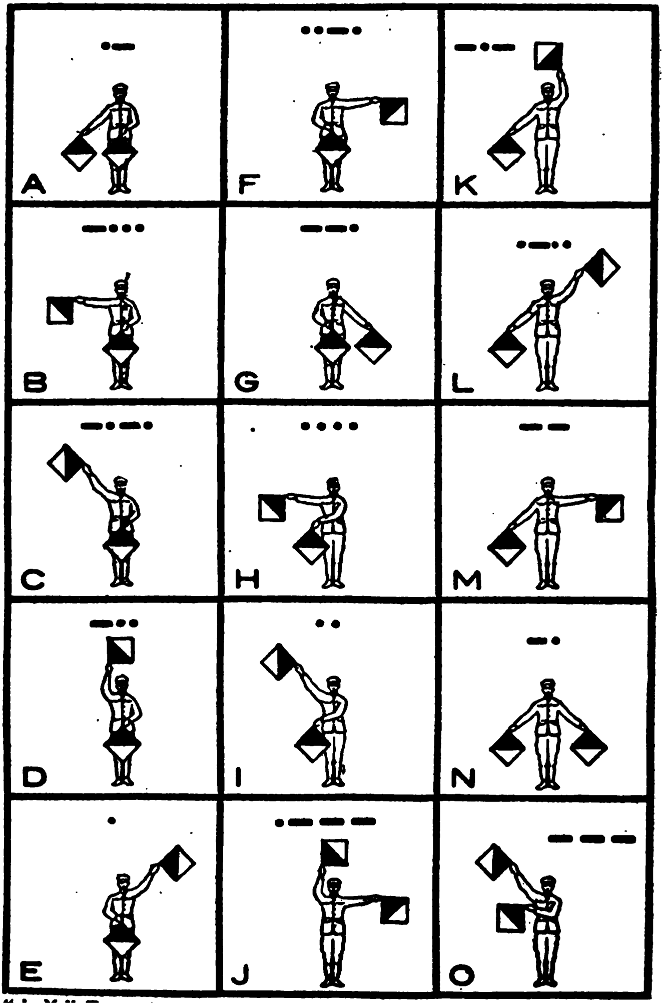
1469. In addition to their use in visual signaling, these flags serve to mark the assembly point of the company when disorganized by combat, and to mark the location of the company in bivouac and elsewhere, when such use is desirable.

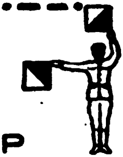
1470. For communication between the firing line and the reserve or commander in rear, the subjoined signals (Signal Corps codes) are prescribed and should be memorized. In transmission, their concealment from the enemy's view should be insured. In the absence of signal flags, the headdress or other substitute may be used.

Letter of alphabet.	If signaled from the rear to the firing line.	If signaled from the firing line to the rear.
A M	Ammunition going forward	Ammunition required.
C C C	Charge (mandatory at all times).	Am about to charge if no instructions to the contrary.
C F	Cease firing	Cease firing.
D T	Double time or "rush."	Double time or "rush" or hurry.
F	Commence firing	Commence firing.
F L	Artillery fire is causing us losses.	Artillery fire is causing us losses.
G	Move forward	Preparing to move forward.
H H H	Halt	Halt.
K	Negative	Negative.
L T	Left	Left.
O (R N, etc) (Semaphore only.)	What is the (range, etc.)? Interrogatory.	What is the (range, etc.)? Interrogatory.
. . — — . . (R N etc.) (Flash and wig wag.)	What is the (range, etc.)? Interrogatory.	What is the (range, etc.)? Interrogatory.
P	Affirmative	Affirmative.
R	Acknowledgment	Acknowledgment.
R N	Range	Range.
R T	Right	Right.
S S S	Support going forward	Support needed.
T	Target	Target.

The Morse equivalents given in the same squares are those of the letters of the alphabet.

THE TWO-ARM SEMAPHORE AND DOT AND DASH CODES.





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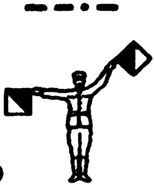

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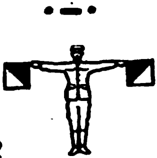

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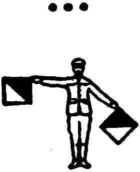

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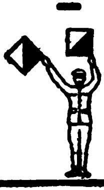

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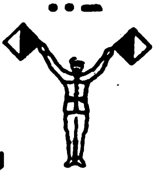

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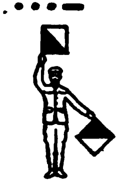

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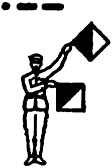

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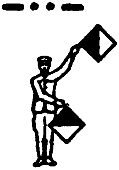

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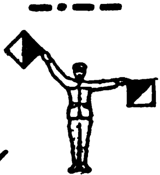

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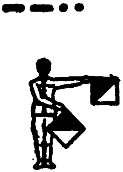

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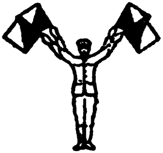
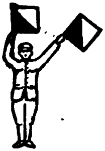
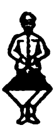
ATTENTION



ANSWERING



BREAK



CHAPTER III.

INFANTRY DRILL.

Sec. I.—SCHOOL OF THE RECRUIT.

1471. The instructor explains briefly each movement, first executing it himself if practicable. He requires the recruits to take the proper positions unassisted and does not touch them for the purpose of correcting them, except when they are unable to correct themselves. He avoids keeping them too long at the same movement, although each should be understood before passing to another. He exacts by degrees the desired precision and uniformity.

1472. In order that all may advance as rapidly as their abilities permit, the recruits are grouped according to proficiency as instruction progresses. Those who lack aptitude and quickness are separated from the others and placed under experienced drill masters.

INSTRUCTION WITHOUT ARMS.

1473. For preliminary instruction a number of recruits, usually not exceeding three or four, are formed as a squad in single rank.

Position of Attention.

1474. Heels on the same line and as near each other as the conformation of the man permits.

Feet turned out equally and forming an angle of about 45°.

Knees straight without stiffness.

Hips level and drawn back slightly; body erect and resting equally on hips; chest lifted and arched; shoulders square and falling equally.

Arms and hands hanging naturally, backs of the hands outward, thumb along the seam of the trousers, elbows near the body.

Head erect and squarely to the front, chin drawn in so that the axis of the head and neck is vertical; eyes straight to the front.

Weight of the body resting equally upon the heels and balls of the feet.

The Rests.

1475. Being at a halt, the commands are: **FALL OUT**; **REST**; **AT EASE**; and, 1. **Parade**, 2. **REST**.

At the command **fall out**, the men may leave the ranks, but are required to remain in the immediate vicinity. They resume their former places at attention, at the command **fall in**.

At the command **rest** each man keeps one foot in place, but is not required to preserve silence or immobility.

At the command **at ease** each man keeps one foot in place and is required to preserve silence but not immobility.

1476. 1. **Parade**, 2. **REST**. Carry the right foot 6 inches straight to the rear, left knee slightly bent; clasp the hands, without constraint, in front of the center of the body, fingers joined, left hand uppermost, backs of hands to the front, left thumb clasped by the thumb and forefinger of the right hand; preserve silence and steadiness of position.

1477. To resume the attention: 1. **Squad**, 2, **ATTENTION**.

The men take the position of attention.

Eyes Right or Left.

1478. 1. **Eyes**, 2. **RIGHT** (**LEFT**) 3. **FRONT**.

At the command **right**, turn the head to the right oblique, eye fixed on the line of eyes of the men in or supposed to be in, the same rank. At the command **front**, turn the head and eyes to the front.

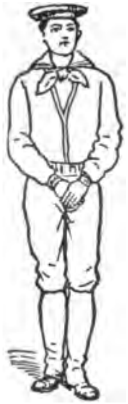


FIG. 128.

Facings.

1479. To the flank: 1. **Right** (**left**), 2. **FACE**.

Raise slightly the left heel and right toe; face to the right, turning on the right heel, assisted by a slight pressure on the ball of the left foot; place the left foot by the side of the right. Left face is executed on the left heel in the corresponding manner.

Right (**left**) **half face** is executed similarly, facing 45°.

"To face in marching" and advance, turn on the ball of either foot and step off with the other foot in the new line of direction; to face in marching without gaining ground in the new direction, turn on the ball of either foot and mark time.

1480. To the rear: 1. **About**, 2. **FACE.**

Carry the toe of the right foot about half foot-length to the rear and slightly to the left of the left heel without changing the position of the left foot; face to the rear, turning to the right on the left heel and right toe; place the right heel by the side of the left.

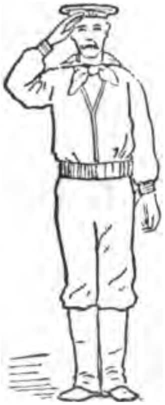


FIG. 129.

Salute With the Hand.

1481. 1. **Hand**, 2. **SALUTE.**

Raise the right hand smartly till the tip of the forefinger touches the lower part of the headdress above the right eye, thumb and fingers extended and joined, palm to the left, forearm inclined at about 45°, hand and wrist straight; at the same time look toward the person saluted. (**TWO**) Drop the arm smartly by the side.

For rules governing salutes, see "Honors and Salutes," Articles 439–446, and U. S. N. R.

STEPS AND MARCHINGS.

1482. All steps and marchings executed from a halt, except right step, begin with the left foot.

1483. The length of the full step in quick time is 30 inches, measured from heel to heel, and the cadence is at the rate of 120 steps per minute.

The length of the full step in double time is 36 inches; the cadence is at the rate of 180 steps per minute.

The instructor, when necessary, indicates the cadence of the step by calling **one, two, three, four,** or **left, right,** the instant the left and right foot, respectively, should be planted.

The command of execution for all movements to be executed while marching is given as either foot strikes the ground, except as otherwise specifically prescribed in these regulations; the movement commences when the following foot is planted.

1484. All steps and marchings and movements involving march are executed in **quick time** unless the squad be marching in **double time**, or **double time** be added to the command; in the latter case **double time** is added to the preparatory command. Example: 1. **Squad right, double time**, 2. **MARCH** (School of the Squad).

Quick Time.

1485. Being at a halt, to march forward in quick time: 1. **Forward**, 2. **MARCH**.

At the command **forward**, shift the weight of the body to the right leg, left knee straight.

At the command **march**, move the left foot smartly straight forward 30 inches from the right, sole near the ground, and plant it without shock; next, in like manner, advance the right foot and plant it as above; continue the march. The arms swing naturally in a fore and aft direction and not across the body.

1486. Being at a halt, or in march in quick time, to march in double time: 1. **Double time**, 2. **MARCH**.

If at a halt, at the first command shift the weight of the body to the right leg. At the command **march**, raise the forearms, fingers closed, thumbs up, knuckles outward, to a horizontal position along the waist line; take up an easy run with the step and cadence of double time, allowing a natural swinging motion to the arms.

If marching in quick time, at the command **march**, given as either foot strikes the ground, take one step in quick time, and then step off in double time.

1487. To resume the quick time: 1. **Quick time**, 2. **MARCH**.

At the command **march**, given as either foot strikes the ground, advance and plant the other foot in double time; resume the quick time, dropping the hands by the sides.

To Mark Time.

1488. Being in march: 1. **Mark time**, 2. **MARCH**.

At the command **march**, given as either foot strikes the ground, advance and plant the other foot; bring up the foot in rear and continue the cadence by alternately raising each foot about 2 inches and planting it on line with the other.

Being at a halt, at the command **march**, raise and plant first the left foot, then the right, as described above.

The Half Step.

1489. 1. **Half step,** 2. **MARCH.**

Take steps of 15 inches in quick time, 18 inches in double time.

1490. Forward, half step, halt, and **mark time** may be executed one from the other in quick or double time.

To resume the full step from half step or mark time: 1. **Forward.** 2. **MARCH.**

Side Step.

1491. Being at a halt or mark time: 1. **Right** (left) **step,** 2. **MARCH.**

Carry and plant the right foot 15 inches to the right; bring the left foot beside it and continue the movement in the cadence of quick time.

The side step is used for short distances only and is not executed in double time.

If at order arms, the side step is executed **at trail** without command.

Back Step.

1492. Being at a halt or mark time: 1. **Backward,** 2. **MARCH.**

Take steps of 15 inches straight to the rear.

The back step is used for short distances only and is not executed in double time.

If at order arms, the back step is executed **at trail** without command.

To Halt.

1493. To arrest the march in quick or double time: 1. **Squad,** 2. **HALT.**

At the command **halt,** given as either foot strikes the ground, plant the other foot as in marching; raise and place the first foot by the side of the other. If in double time, drop the hands by the sides.

To March by the Flank.

1494. Being in march: 1. **By the right** (left) **flank,** 2. **MARCH.**

At the command **march,** given as the right foot strikes the ground, advance and plant the left foot, then face to the right in marching and step off in the new direction with the right foot.

To March to the Rear.

1495. Being in march: 1. **To the rear,** 2. **MARCH.**

At the command **march,** given as the right foot strikes the ground, advance and plant the left foot; turn to the right about on the balls of both feet and immediately step off with the left foot.

If marching in double time, turn to the right about, taking four steps in place, keeping the cadence, and then step off with the left foot.

Change Step.

1496. Being in march: 1. **Change step,** 2. **MARCH.**

At the command **march,** given as the right foot strikes the ground, advance and plant the left foot; plant the toe of the right foot near the heel of the left and step off with the left foot.

The change on the right foot is similarly executed, the command **march** being given as the left foot strikes the ground.

MANUAL OF ARMS.

1497. As soon as practicable the recruit is taught the use, nomenclature, and care of his rifle (See Art. 1717 et seq.); when fair progress has been made in the instruction without arms, he is taught the manual of arms; instruction without arms and that with arms alternate.

In describing the manual of arms, the term "At the balance" in this text refers to the actual center of gravity of the model 1903 rifle and to the center of the groove on the hand guard of the model 1917 rifle.

1498. The following rules govern the carrying of the piece:

First. The piece is not carried with cartridges in either the chamber or the magazine, except when specifically ordered. When so loaded, or supposed to be loaded, it is habitually carried locked; that is, with the **safety lock** turned to the "safe." At all other times it is carried unlocked, with the trigger pulled.

Second. Whenever troops are formed under arms, pieces are immediately inspected at the commands: 1. **Inspection,** 2. **ARMS;** 3. **Order (Right shoulder, port),** 4. **ARMS.**

A similar inspection is made immediately before dismissal.

If cartridges are found in the chamber or magazine, they are removed and placed in the belt.

Third. The cut-off is kept turned "off" except when cartridges are actually used.

Fourth. The bayonet is not fixed except for bayonet training, on guard, at ceremonies, or for combat.

Fifth. **Fall in** is executed with the piece at the order arms. **Fall out, rest,** and **at ease,** are executed as without arms. On resuming **attention** the position of order arms is taken.

Sixth. If at the order, unless otherwise prescribed, the piece is brought to the right shoulder at the command **march,** the three motions corresponding with the first three steps (Arts. 1491 and 1492). Movements may be executed at the trail by prefacing the preparatory command with the words **at trail**; as, 1. **At trail, forward,** 2. **MARCH**; the trail is taken at the command **march.**

When the facings, alignments, open and close ranks, taking interval or distance, and assemblings are executed from the order, raise the piece to the trail while in motion and resume the order on halting.

Seventh. The piece is brought to the order on halting. The execution of the order begins when the halt is completed.

Eighth. A disengaged hand in double time is held as when without arms.

1499. The following rules govern the execution of the manual of arms:

First. In all positions of the left hand at the balance (center of gravity, bayonet unfixed) the thumb clasps the piece; the sling is included in the grasp of the hand.

Second. In all positions of the piece "diagonally across the body" the position of the piece, left arm and hand are the same as in port arms.

Third. In resuming the order from any position in the manual, the motion next to the last concludes with the butt of the piece about 3 inches from the ground, barrel to the rear, the left hand above and near the right, steadying the piece, fingers extended and joined, palm of hand to the rear, forearm and wrist straight and inclining downward, all fingers of the right hand grasping the piece. To complete the order, lower the piece gently to the ground with the right hand, drop the left quickly by the side, and take the position of order arms.

Allowing the piece to drop through the right hand to the ground or other similar abuse of the rifle to produce effect in executing the manual is prohibited.

Fourth. The cadence of the motions is that of quick time; the recruits are first required to give their whole attention to the details of the motions, the cadence being gradually acquired as they become accustomed to handling their pieces. The instructor may require them to count aloud in cadence with the motions.

Fifth. The manual is taught at a halt and the movements are, for the purpose of instruction, divided into motions and executed in detail; in this case the command of **execution** determines the prompt execution of the first motion, and the commands, **two, three, four,** that of the other motions.

To execute the movements in detail, the instructor first cautions: **By the numbers**; all movements divided into motions are then executed as above explained until he cautions: **Without the numbers,** or commands movements other than those in the manual of arms.

Sixth. Whenever circumstances require, the regular positions of the manual of arms and the firings may be ordered without regard to the previous position of the piece.

Under exceptional conditions of weather or fatigue, the rifle may be carried in any manner directed.

1500. Position of order arms standing: The butt rests evenly on the ground, barrel to the rear, toe of the butt on a line with toe of, and touching, the right shoe, arms and hands hanging naturally, right hand holding the piece between the thumb and fingers.

1501. Being at order arms: 1. **Present,** 2. **ARMS.**

With the right hand carry the piece in front of the center of the body, barrel to the rear and vertical, grasp it with the left hand at the balance, forearm horizontal and resting against the body. (**TWO**) Grasp the small of the stock with the right hand.

1502. Being at order arms: 1. **Port,** 2. **ARMS.**

With the right hand raise and throw the piece diagonally across the body, grasp it smartly with both hands; the right, palm down, at the small of the stock; the left, palm up, at the balance; barrel up, sloping to the left and crossing opposite the junction of the neck with the left shoulder; right forearm horizontal; left forearm resting against the body; the piece in a vertical plane parallel to the front.

1503. Being at present arms: 1. **Port,** 2. **ARMS.**

Carry the piece diagonally across the body and take the position of port arms.

1504. Being at port arms: 1. **Present,** 2. **ARMS.**

Carry the piece to a vertical position in front of the center of the body and take the position of present arms.

1505. Being at present or port arms: 1. **Order,** 2. **ARMS.**

Let go with the right hand; lower and carry the piece to the right with the left hand; regrasp it with the right hand just above the lower band; let go with the left hand, and take the next to the last position in coming to the order. (**TWO**) Complete the order.

1506. Being at order arms: 1. **Right shoulder,** 2. **ARMS.**

With the right hand raise and throw the piece diagonally across the body; carry the right hand quickly to the butt, embracing it, the heel between the first two fingers. (**TWO**) Without changing the grasp of the right hand, place the piece on the right shoulder, barrel up and inclined at an angle of about 45° from the horizontal, trigger guard in the hollow of the shoulder, right elbow near the side, the piece in a vertical plane perpendicular to the front; carry the left hand, thumb and fingers extended and joined, to the small of the stock, tip of the forefinger touching the cocking piece, wrist straight and elbow down. (**THREE**) Drop the left hand by the side.

1507. Being at right shoulder arms: 1. **Order**, 2. **ARMS**.

Press the butt down quickly and throw the piece diagonally across the body, the right hand retaining the grasp of the butt. (**TWO**), (**THREE**) Execute order arms as described from port arms.

1508. Being at port arms: 1. **Right shoulder**, 2. **ARMS**.

Change the right hand to the butt. (**TWO**), (**THREE**) As in right shoulder arms from order arms.

1509. Being at right shoulder arms: 1. **Port**, 2. **ARMS**.

Press the butt down quickly and throw the piece diagonally across the body, the right hand retaining its grasp of the butt (**TWO**) Change the right hand to the small of the stock.

1510. Being at right shoulder arms: 1. **Present**, 2. **ARMS**.

Execute port arms. (**THREE**) Execute present arms.

1511. Being at present arms: 1. **Right shoulder**, 2. **ARMS**.

Execute port arms. (**TWO**), (**THREE**), (**FOUR**) Execute right shoulder arms as from port arms.

1512. Being at port arms: 1. **Left shoulder**, 2. **ARMS**.

Carry the piece with the right hand and place it on the left shoulder, barrel up, trigger guard in the hollow of the shoulder; at the same time grasp the butt with the left hand, heel between first and second fingers, thumb and fingers of right hand closed on the stock. (**TWO**) Drop the right hand by the side.

Being at left shoulder arms: 1. **Port**, 2. **ARMS**.

Grasp the piece with the right hand at the small of the stock. (**TWO**) Carry the piece to the right with the right hand, regrasp it with the left, and take the position of port arms.

Left shoulder arms may be ordered directly from the order, right shoulder or present, or the reverse. At the command **arms** execute **port arms** and continue in cadence to the position ordered.

1513. Being at order arms: 1. **Parade**, 2. **REST**.

Carry the right foot 6 inches straight to the rear, left knee slightly bent; carry the muzzle in front of the center of the body, barrel to the left; grasp the piece with the left hand just below the stacking swivel, and with the right hand below and against the left.

Being at parade rest: 1. **Squad,** 2. **ATTENTION.**

Resume the order, the left hand quitting the piece opposite the right hip.

1514. Being at order arms: 1. **Trail,** 2. **ARMS.**

Raise the piece, right arm slightly bent, and incline the muzzle forward so that the barrel makes an angle of about 30° with the vertical.

When it can be done without danger or inconvenience to others, the piece may be grasped at the balance and the muzzle lowered until the piece is horizontal; a similar position in the left hand may be used.

1515. Being at trail arms: 1. **Order,** 2. **ARMS.**

Lower the piece with the right hand and resume the order.

Rifle Salute.

1516. Being at right shoulder arms: 1. **Rifle,** 2. **SALUTE.**

Carry the left hand smartly to the small of the stock, forearm horizontal, palm of hand down, thumb and fingers extended and joined forefinger touching end of cocking piece; look toward the person saluted. **(TWO)** Drop left hand by the side; turn head and eyes to the front.

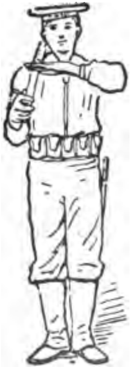


FIG. 130.

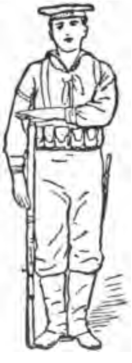


FIG. 131.

1517. Being at order or trail arms: 1. **Rifle,** 2. **SALUTE.**

Carry the left hand smartly to the right side, palm of the hand down, thumb and fingers extended and joined, forefinger against piece near the muzzle; look toward the person saluted. (**TWO**) Drop the left hand by the side; turn the head and eyes to the front.

For rules governing salutes, see "Honors and Salutes" (Arts. 439–446) and U. S. N. R.

The Bayonet.

1518. Being at order arms: 1. **Fix,** 2. **BAYONET.**

If the bayonet scabbard is carried on the belt: Execute parade rest; grasp the bayonet with the right hand, back of hand toward the body; draw the bayonet from the scabbard and fix it on the barrel, glancing at the muzzle; resume the order.

If the bayonet is carried on the haversack: Draw the bayonet with the left hand and fix it in the most convenient manner.

1519. Being at order arms: 1. **Unfix,** 2. **BAYONET.**

If the bayonet scabbard is carried on the belt: Execute parade rest; grasp the handle of the bayonet firmly with the right hand, pressing the spring with the forefinger of the right hand; raise the bayonet until the handle is about 12 inches above the muzzle of the piece; drop the point to the left, back of the hand toward the body, and, glancing at the scabbard, return the bayonet, the blade passing between the left arm and the body; regrasp the piece with the right hand and resume the order.

If the bayonet scabbard is carried on the haversack: Take the bayonet from the rifle with the left hand and return it to the scabbard in the most convenient manner.

If marching or lying down, the bayonet is fixed and unfixed in the most expeditious and convenient manner and the piece returned to the original position.

Fix and unfix bayonet are executed with promptness and regularity but not in cadence.

1520. CHARGE BAYONET. Whether executed at halt or in motion, the bayonet is held toward the opponent as in the position of **guard** in Bayonet Training, Art. 2294.

Exercises for instruction in bayonet combat are prescribed in Part II, Chap. XI, Bayonet Training.

The Inspection.

1521. Being at order arms: 1. **Inspection,** 2. **ARMS.**

At the second command take the position of port arms. (**TWO**) Seize the bolt handle with the thumb and forefinger of the right hand, turn the handle up, draw the bolt back, and glance at the chamber. Having found the chamber empty, or having emptied it, raise the head and eyes to the front.

1522. Being at inspection arms: 1. **Order (Right shoulder, port),** 2. **ARMS.**

At the preparatory command push the bolt forward, turn the handle down, pull the trigger, and resume port arms. At the command arms, complete the movement ordered.

To Dismiss the Squad.

1523. Being at halt: 1. **Inspection,** 2. **ARMS,** 3. **Port,** 4. **ARMS,** 5. **DISMISSED.**

Sec. II.—SCHOOL OF THE SQUAD.

1524. Men are grouped into squads for purposes of instruction, discipline, control, and order.

1525. The squad proper consists of a 2 p. o. and seven men.

The movements in the School of the Squad are designed to make the squad a fixed unit and to facilitate the control and movement of the company. If the number of men grouped is more than 3 and less than 12, they are formed as a squad of 4 files, the excess above 8 being posted as file closers. If the number grouped is greater than 11, 2 or more squads are formed and the group is termed a platoon. (See Art. 1529.)

For the instruction of recruits, these rules may be modified.

1526. A 2 p. o. is the squad leader, and when absent is replaced by a designated man. If none is designated, the senior in length of service acts as leader.

The 2 p. o., when in ranks, is posted as the left man in the front rank of the squad.

When he leaves the ranks to lead his squad, his rear-rank man steps into the front rank, and the file remains blank until the squad leader returns to his place in ranks, when his rear-rank man steps back into the rear rank.

1527. In battle officers and 1 p. os. endeavor to preserve the integrity of squads; they designate new leaders to replace those disabled, organize new squads when necessary, and see that every man is placed in a squad.

Men are taught the necessity of remaining with the squad to which they belong and, in case it be broken up or they become separated therefrom, to attach themselves to the nearest squad and platoon leaders, whether these be of their own or of another organization.

1528. The squad executes the **halt, rests, facings, steps** and **marchings,** and the **manual of arms** as explained in the School of the Recruit.

Organization of the Squad.

1529. The squad consists of 1 p. o., 6 riflemen, and 1 auto-rifleman. One rifleman is equipped with a grenade discharger. One rifleman carries extra ammunition for the automatic rifle and serves as replacement for the auto-rifleman. All riflemen carry a certain supply of extra ammunition for the automatic rifle, and when necessary, rifle and hand grenades.

The general training of the members of the squad will be uniform. All men will be trained in the use of the rifle and automatic rifle. Training in the use of grenades will be supplementary to training with the rifle and the automatic rifle.

To form the squad, the instructor places himself 3 paces in front of where the center is to be and commands: **FALL IN.**

The men assemble at attention, pieces at the order, and are arranged by the p. o. in double rank, as nearly as practicable in order of height from right to left, each man dropping his left hand as soon as the man on his left has his interval. The rear rank forms with distance of 40 inches. The men on the left of the squad (left file) do not bring up their arms unless the squad is part of a larger unit.

The instructor then commands: **COUNT OFF.**

At this command, all except the right file execute **eyes right,** and beginning on the right, the men in each rank count, **one, two, three, four;** each man turns his head and eyes to the front as he counts.

Pieces are then inspected.

As soon as its organization has been permanently fixed, the squad forms as follows: Nos. 1 front and rear rank, No. 2 rear rank, No. 4 rear rank, riflemen; No. 2 front rank, rifleman with grenade discharger; No. 3 rear rank, auto-rifleman; No. 3 front rank, substitute auto-rifleman and carrier; No. 4 front rank, petty officer.

Alignments.

1530. To align the squad, the base file or files having been established: 1. **Right (left)**, 2. **DRESS**, 3. **FRONT**.

At the command **dress** all men place the left hand upon the hip (whether dressing to the right or left); each man, except the base file, when on or near the new line executes **eyes right**, and, taking steps of 2 or 3 inches, places himself so that his right arm rests lightly against the arm of the man on his right, and so that his eyes and shoulders are in line with those of the men on his right; the rear rank men cover in file.

The instructor verifies the alignment of both ranks from the right flank and orders up or back such men as may be in rear, or in advance of the line; only the men designated move.

At the command **front**, given when the ranks are aligned, each man turns his head and eyes to the front and drops his left hand by his side.

In the first drills the basis of the alignment is established on, or parallel to, the front of the squad; afterwards, in oblique directions.

Whenever the position of the base file or files necessitates a considerable movement of the squad, such movement will be executed by marching to the front or oblique, to the flank or backward, as the case may be, without other command, and at the trail.

1531. To preserve the alignment when marching: **GUIDE RIGHT (LEFT)**.

The men preserve their intervals from the side of the guide, yielding to pressure from that side and resisting pressure from the opposite direction; they recover intervals, if lost, by gradually opening out or closing in; they recover alignment by slightly lengthening or shortening the step; the rear-rank men cover their file leaders at 40 inches.

In double rank, the front-rank man on the right, or designated flank, conducts the march; when marching faced to the flank, the leading man of the front rank is the guide.

To Take Intervals and Distances.

1532. Being in line at a halt: 1. **Take interval**, 2. **To the right (left)**, 3. **MARCH**, 4. **Squad**, 5. **HALT**.

At the second command the rear-rank men march backward 4 steps and halt; at the command **march** all face to the right and the leading man of each rank steps off; the other men step off in succession, each following the preceding man at 4 paces, rear-rank men marching abreast of their file leaders.

At the command **halt**, given when all have their intervals, all halt and face to the front.

1533. Being at intervals, to assemble the squad: 1. **Assemble to the right** (left), 2. **MARCH.**

The front-rank man on the right stands fast, the rear-rank man on the right closes to 40 inches. The other men face to the right, close by the shortest line, and face to the front.

1534. Being in line at a halt and having counted off: 1. **Take distance**, 2. **MARCH**, 3. **Squad**, 4. **HALT.**

At the command **march** No. 1 of the front rank moves straight to the front; Nos. 2, 3, and 4 of the front rank and Nos. 1, 2, 3, and 4 of the rear rank, in the order named, move straight to the front, each stepping off so as to follow the preceding man at 4 paces. The command **halt** is given when all have their distances.

In case more than one squad is in line, each squad executes the movement as above. The guide of each rank of numbers is right.

1535. Being at distances, to assemble the squad: 1. **Assemble**, 2. **MARCH.**

No. 1 of the front rank stands fast; the other numbers move forward to their proper places in line.

To Stack and Take Arms.

1536. Being in line at a halt: **STACK ARMS.**

Each even number of the front rank grasps his piece with the left hand at the upper band and rests the butt between his feet, barrel to the front, muzzle inclined slightly to the front and opposite the center of the interval on his right, the thumb and forefinger raising the stacking swivel; each even number of the rear rank then passes his piece, barrel to the rear, to his file leader, who grasps it between the bands with his right hand and throws the butt about 2 feet in advance of that of his own piece and opposite the right of the interval, the right hand slipping to the upper band, the thumb and forefinger raising the stacking swivel, which he engages with that of his own piece; each odd number of the front rank raises his piece with the right hand, carries it well forward, barrel to the front; the left hand guiding the stacking swivel, engages the lower hook of the swivel of his own piece with the free hook of that of the even number of the rear rank; he then turns the barrel outward into the angle formed by the other two pieces and lowers the butt to the ground, to the right of and against the toe of his right shoe.

The stacks made, the loose pieces are laid on them by the even numbers of the front rank.

When each man has finished handling pieces, he takes the position of attention.

1537. Being in line behind the stacks: **TAKE ARMS.**

The loose pieces are returned by the even numbers of the front rank, each even number of the front rank grasps his own piece with the left hand, the piece of his rear-rank man with his right hand, grasping both between the bands; each odd number of the front rank grasps his piece in the same way with the right hand, disengages it by raising the butt from the ground and then, turning the piece to the right, detaches it from the stack; each even number of the front rank disengages and detaches his piece by turning it to the left, and then passes the piece of his rear-rank man to him, and all resume the order.

1538. Should any squad have Nos. 2 and 3 blank files, No. 1 rear rank takes the place of No. 2 rear rank in making and breaking the stack; the stacks made or broken, he resumes his post.

Pieces not used in making the stack are termed **loose pieces.**

Pieces are never stacked with the bayonet fixed.

The Oblique March.

1539. For the instruction of recruits, the squad being in column or correctly aligned, the instructor causes the squad to face half right or half left, points out to the men their relative positions, and explains that these are to be maintained in the oblique march.

1540. 1. **Right (left) oblique,** 2. **MARCH.**

Each man steps off in a direction 45° to the right of his original front. He preserves his relative position, keeping his shoulders parallel to those of the guide (the man on the right front of the line or column), and so regulates his steps that the ranks remain parallel to their original front.

At the command **halt** the men halt and face to the front.

To resume the original direction: 1. **Forward,** 2. **MARCH.**

The men half face to the left in marching and then move straight to the front.

If at **half step** or **mark time** while obliquing, the oblique march is resumed by the commands: 1. **Oblique,** 2. **MARCH.**

To Turn on Moving Pivot.

1541. Being in line: 1. **Right** (**left**) **turn**, 2. **MARCH**.

The movement is executed by each rank successively and on the same ground. At the command **MARCH**, given on the right foot, all advance and plant left foot; number one front rank faces to the right in marching, takes one full step, followed by eight half steps, ten counts in all. Number two half faces to the right and takes two full steps (counts 2 and 3), half faces to the right again and takes two full steps (counts 4 and 5) comes on line with number one at fifth count, then takes five half steps (counts 6, 7, 8, 9, and 10). Number three half faces to right after first count, takes three full steps (counts 2, 3 and 4), half faces to right and takes three full steps

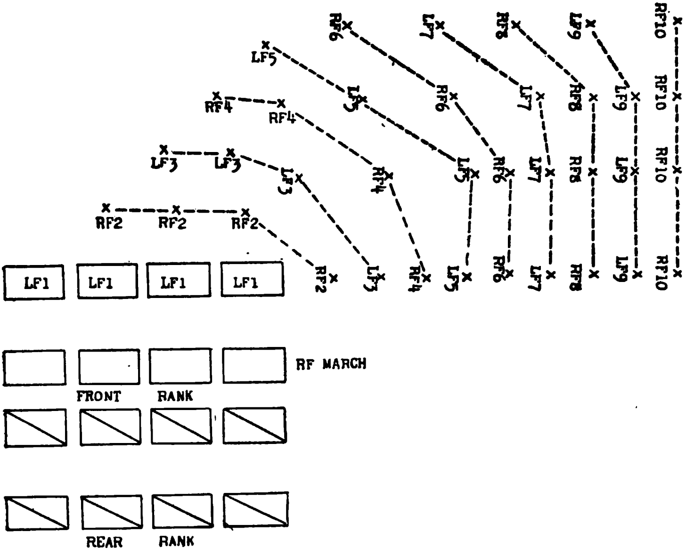


FIG. 132.

(counts 5, 6, and 7), then takes three half steps (counts 8, 9, and 10), coming on line with numbers one and two at seventh count. Number four half faces to right after first count, takes four full steps (counts 2, 3, 4 and 5), half faces to right and takes five full steps (counts 6, 7, 8, 9, and 10) coming on line with numbers one, two and three at tenth count. All step off with full step for the 11th count.

Right (Left) half turn is executed in a similar manner. The pivot man makes a half change of direction to the right and the other men make quarter changes in obliquing.

To Turn on Fixed Pivot.

1542. Being in line, to turn and march: 1. **Squad right (left),** 2. **MARCH**.

At the second command, the right-flank man in the front rank faces to the right in marching and marks time for five counts, the other front-rank men oblique to the right, place themselves abreast of the pivot, and mark time. In the rear rank the third man from the right, followed in column by the second and first, moves straight to the front until in rear of his front-rank man, when all face to the right in marching and mark time; the other number of the rear rank moves straight to the front four paces and places himself abreast of the man on his right. Men on the new line glance toward the marching flank while marking time, and as the last man arrives on the line both ranks execute **forward, march,** without command.

1543. Being in line, to turn and halt: 1. **Squad right (left),** 2. **MARCH**, 3. **Squad**, 4. **HALT**.

The third command is given immediately after the second. The turn is executed as prescribed in the preceding paragraph, except that all men, on arriving on the new line, mark time until the fourth command is given, when all halt. The fourth command should be given as the last man arrives on the line.

1544. Being in line, to turn about and march: 1. **Squad right (left) about,** 2. **MARCH**.

At the second command, the front rank twice executes **squad right,** initiating the second **squad right** when the man on the marching flank has arrived abreast of the rank. In the rear rank, the third man from the right, followed by the second and first in column, moves straight to the front until on the prolongation of the line to be occupied by the rear rank; changes direction to the right; moves in the new direction until in rear of his front-rank man, when all face to the right in marching, mark time, and glance toward the marching flank. The fourth man marches on the left of the third to his new position; as he arrives on the line, both ranks execute **forward, march,** without command.

1545. Being in line, to turn about and halt: 1. **Squad right (left) about,** 2. **MARCH,** 3. **Squad,** 4. **HALT.**

The third command is given immediately after the second. The turn is executed as prescribed in the preceding paragraph except that all men, on arriving on the new line, mark time until the fourth command is given, when all halt. The fourth command should be given as the last man arrives on the line.

To Follow the Petty Officer.

1546. Being assembled or deployed, to march the squad without unnecessary commands, the petty officer places himself in front of it and commands: **FOLLOW ME.**

If in line or skirmish line, No. 2 of the front rank follows in the trace of the petty officer at about 3 paces; the other men conform to the movements of No. 2, guiding on him and maintaining their relative positions.

If in column, the head of the column follows the petty officer.

To Deploy as Skirmishers.

1547. Being in any formation, assembled: 1. **As skirmishers,** 2. **MARCH.**

The petty officer places himself in front of the squad, if not already there. Moving at a run, the men place themselves abreast of the petty officer at 5-pace intervals, Nos. 1 and 2 on his right, Nos. 3 and 4 on his left, rear-rank men on the right of their file leaders, extra men on the left of No. 4; all then conform to the petty officer's gait.

When the squad is acting alone, skirmish line is similarly formed on No. 2 of the front rank, who stands fast or continues the march, as the case may be; the squad leader places himself in front of the squad when advancing and in rear when halted.

When deployed as skirmishers, the men march at ease, pieces at the trail unless otherwise ordered.

The squad leader is the guide when in line; otherwise No. 2 front rank is the guide.

1548. The normal interval between skirmishers is 5 paces. The front of a squad thus deployed as skirmishers is about 40 yards.

To Increase or Diminish Intervals.

1549. If assembled, and it is desired to deploy at greater than the normal interval; or if deployed, and it is desired to increase or decrease the interval: 1. **As skirmishers (so many) paces,** 2. **MARCH.**

Intervals are taken at the indicated number of paces. If already deployed, the men move by the flank toward or away from the guide.

The Assembly.

1550. Being deployed: 1. **Assemble,** 2. **MARCH.**

The men move toward the squad leader and form in their proper places.

If the squad leader continues to advance, the men move in double time, form, and follow him.

The assembly while marching to the rear is not executed.

Kneeling and Lying.

1551. If standing: **KNEEL.**

Half face to the right; carry the right toe about 1 foot to the left rear of the left heel; kneel on right knee, sitting as nearly as possible on the right heel; left forearm across left thigh; piece remains in position of order arms, right hand grasping it above the lower band.

1552. If standing or kneeling: **LIE DOWN.**

Kneel, but with right knee against left heel; carry back the left foot and lie flat on the belly, inclining body about 35° to the right; piece horizontal, barrel up, muzzle off the ground and pointed to the front; elbows on the ground; left hand at the balance, right hand grasping the small of the stock opposite the neck. This is the position of order arms, lying down.

1553. If kneeling or lying down: **RISE.**

If kneeling, stand up, faced to the front, on the ground marked by the left heel.

If lying down, raise body on both knees; stand up, faced to the front, on the ground marked by the knees.

1554. If lying down: **KNEEL.**

Raise the body on both knees; take the position of kneel.

1555. In double rank, the positions of kneeling and lying down are ordinarly used only for the better utilization of cover.

When deployed as skirmishers, a sitting position may be taken in lieu of the position kneeling.

LOADINGS AND FIRINGS.

1556. The commands for loading and firing are the same whether standing, kneeling, or lying down. The firings are always executed at a halt.

When kneeling or lying down in double rank, the rear rank does not load, aim, or fire.

The instruction in firing will be preceded by a command for loading.

Loadings are executed in line and skirmish line only.

1557. Pieces having been ordered loaded are kept loaded without command until the command **unload**, or **inspection arms**, fresh clips being inserted when the magazine is exhausted.

1558. The aiming point or target is carefully pointed out. This may be done before or after announcing the sight setting. Both are indicated before giving the command for firing, but designation of the target may be omitted when the target appears suddenly and is unmistakable, but the range must be announced, the command **BATTLE SIGHT** being given when it is not desired to have the sights set. The command for range serves as a preparatory command for firing. It insures the simultaneous opening of fire and the full effect of suprise.

1559. The target or aiming point having been designated and the sight setting announced, such designation or announcement need not be repeated until a change of either or both is necessary.

Troops are trained to continue their fire upon the aiming point or target designated, and at the sight setting announced, until a change is ordered.

1560. If the men are not already in the position of load, that position is taken at the announcement of the sight setting; if the announcement is omitted, the position is taken at the first command for firing.

1561. The use of the sling as an aid to accurate firing is desirable at all ranges, and is absolutely essential at ranges greater than 300 yards.

To Load.

1562. Being in line or skirmish line at halt: 1. **With dummy (blank or ball) cartridges**, 2. **LOAD.**

At the command **load** each front-rank man or skirmisher faces half right and carries the right foot to the right, about 1 foot, to such position as will insure the greatest firmness and steadiness of the body; raises, or lowers, the piece and drops it into the left hand at the balance, left thumb extended along the stock, muzzle at the height of the breast, if armed with 1903 model, turns the cut-off up. With the right hand he turns and draws the bolt back, takes a loaded clip and inserts the end in the clip slots, places the thumb on the powder space of the top cartridge, the fingers extending around the piece and tips resting on the magazine floor plate; forces the cartridges into the magazine by pressing down with the thumb; without removing the clip, thrusts the bolt home, turning down the handle; turns the safety lock to the "safe" and carries the hand to the small of the stock. Each rear-rank man moves to the right front, takes a similar position opposite the interval to the right of his front-rank man, muzzle of the piece extending beyond the front rank, and loads.

Auto-riflemen do not execute the loadings and firings in line.

A skirmish line may load while moving, the pieces being held as nearly as practicable in the position of load.

If kneeling or sitting, the position of the piece is similar; if kneeling, the left forearm rests on the left thigh; if sitting the elbows are supported by the knees. If lying down, the left hand steadies and supports the piece at the balance, the toe of the butt resting on the ground, the muzzle off the ground.

For reference, these positions (standing, kneeling, and lying down) are designated as that of **load**.

1563. For instruction in loading: 1. **Simulate**, 2. **LOAD**.

Executed as above described except that the cut-off remains "off" and the handling of cartridges is simulated.

The recruits are first taught to **simulate** loading and firing; after a few lessons dummy cartridges may be used. Later, blank cartridges may be used.

1564. The 1903 model rifle may be used as a single loader by turning the magazine "off." The magazine may be filled in whole or in part while "off" or "on" by pressing cartridges singly down and back until they are in the proper place. The use of the rifle as a single loader is, however, to be regarded as exceptional. The model 1917 rifle cannot be used as a single loader.

To Unload.

1565. UNLOAD.

Take the position of load, turn the safety lock up (if armed with 1917 rifle turn safety lock to front) and move bolt alternately back and forward until all the cartridges are ejected. After the last cartridge is ejected the chamber is closed by first thrusting the bolt slightly forward to free it from the stud holding it in place when the chamber is open, pressing the follower down and back to engage it under the bolt, and then thrusting the bolt home; the trigger is pulled. The cartridges are then picked up, cleaned, and returned to the belt and the piece is brought to the order.

To Set the Sight.

1566. **RANGE, ELEVEN HUNDRED** (**EIGHT-FIFTY**, etc.), or **BATTLE SIGHT**.

The sight is set at the elevation indicated. The instructor explains and verifies sight settings.

To Fire by Volley.

1567. 1. **READY**, 2. **AIM**, 3. **Squad**, 4. **FIRE**.

At the command **ready** turn the safety lock to the "ready"; at the command **aim** raise the piece with both hands and support the butt firmly against the hollow of the right shoulder, right thumb clasping the stock, barrel horizontal, left elbow well under the piece, right elbow as high as the shoulder; incline the head slightly forward and a little to the right, cheek against the stock, left eye closed, right eye looking through the notch of the rear sight so as to perceive the object aimed at, second joint of forefinger resting lightly against the front of the trigger and taking up the slack; top of front sight is carefully raised into, and held in, the line of sight.

Each rear-rank man aims through the interval to the right of his file leader and leans slightly forward to advance the muzzle of his piece beyond the front rank.

In aiming kneeling, the left elbow rests on the left knee, point of elbow in front of kneecap. In aiming sitting, the elbows are supported by the knees.

In aiming lying down, raise the piece with both hands, rest on both elbows, and press the butt firmly against the right shoulder.

At the command **fire** press the finger against the trigger; fire without deranging the aim and without lowering or turning the piece; lower the piece to the position of **Load** and load.

1568. To continue the firing: 1. **AIM**, 2. **Squad**, 3. **FIRE**.

Each command is executed as previously explained. **Load** (from magazine) is executed by drawing back and thrusting home the bolt with the right hand, leaving the safety lock at the "ready."

To Fire at Will.

1569. **FIRE AT WILL.**

Each man, independently of the others, comes to the **ready, aims** carefully and deliberately at the aiming point or target, **fires, loads,** and continues the firing until ordered to **suspend** or **cease firing.**

1570. To increase (decrease) the rate of fire in progress the instructor shouts: **FASTER (SLOWER).**

The rate of fire is dependent on the training of the individual. It must not be so great as to preclude accurate aim or proper trigger squeeze.

Men are trained to fire at the rate of about three shots per minute at effective ranges and five or six at close ranges, devoting the minimum of time to loading and the maximum to deliberate aiming. To illustrate the necessity for deliberation, and to habituate men to combat conditions, small and comparatively indistinct targets are designated.

To Suspend Firing.

1571. The instructor blows a **long blast** of the whistle and repeats same, if necessary, or commands: **SUSPEND FIRING.**

Firing stops; pieces are held, loaded and locked, in a position of readiness for instant resumption of firing, rear sights unchanged. The men continue to observe the target or aiming point, or the place at which the target disappeared, or at which it is expected to reappear.

This whistle signal may be used as a preliminary to **cease firing.**

To Cease Firing.

1572. **CEASE FIRING.**

Firing stops; pieces not already there are brought to the position of load; those not loaded are loaded; sights are laid, pieces are locked and brought to the order.

Cease firing is used for long pauses, to prepare for changes of position, or to steady the men.

1573. Commands for suspending or ceasing fire may be given at any time after the preparatory command for firing whether the firing has actually commenced or not.

INSTRUCTION OF THE SKIRMISHER.

1574. The instruction of the recruit in the use of the rifle should begin at an early period in his training. It should be impressed on him that the rifle is his principal weapon and that the object of all movement is to place him at such point that he can make effective use of it.

THE USE OF COVER.

1575. The recruit should be given careful instruction in the individual use of cover.

It should be impressed upon him that, in taking advantage of natural cover, he must be able to fire easily and effectively upon the enemy. If advancing on an enemy, he must do so steadily and as rapidly as possible. He must conceal himself as much as possible while firing and while advancing. While setting his sight, he should be under cover or lying prone.

1576. To teach him to fire easily and effectively, at the same time concealing himself from the view of the enemy, he is practiced in simulated firing in the prone, sitting, kneeling, and crouching positions, from behind hillocks, trees, heaps of earth or rocks, from depressions, gullies, ditches, doorways, or windows. He is taught to fire around the right side of his concealment whenever possible, or, when this is not possible, to rise enough to fire over the top of his concealment. He is taught to improve natural cover and adapt it as a firing position by the use of the intrenching tool.

When these details are understood, he is required to select cover with reference to an assumed enemy and to place himself behind it in proper position for firing. Rapid loading and accurate sight setting, and quick and skillful occupation of firing positions are practiced. He should be instructed in the value of the different forms of cover as protection from both terrestrial and aerial view, and from high-angle infantry and artillery fire.

1577. The evil of remaining too long in one place, however good the concealment, should be explained. He should be taught to advance from cover to cover, selecting cover in advance before leaving his concealment.

It should be impressed upon him that a man running rapidly toward an enemy furnishes a poor target. He should be trained in springing from a prone position behind concealment, running at top speed to cover and throwing himself behind it. He should also be practiced in advancing from cover to cover by crawling, or by lying on the left side, rifle grasped in the right hand, and pushing himself forward with the right leg. He should be taught to move on designated direction points, making use of cover to screen his movements without losing the direction of advance.

1578. He should be taught that, when fired on while acting independently, he should drop to the ground, seek cover, and then endeavor to locate his enemy.

1579. The instruction of the recruit in the use of cover is continued in the combat exercises of the platoon, but he must then be taught that the proper advance of the platoon or company and the effectiveness of its fire are of greater importance than the question of cover for individuals. He should also be taught that he may not move about or shift his position in the firing line except the better to see the target.

OBSERVATION.

1580. The ability to use his eyes accurately is of great importance to the soldier. The recruit should be trained in observing his surrounding from positions and when on the march.

He should be practiced in pointing out and naming military features of the ground; in distinguishing between living beings; in counting distant groups of objects or beings; in recognizing colors and forms.

1581. In the training of men in the mechanism of the firing line, they should be practiced in repeating to one another target and aiming point designations and in quickly locating and pointing out a designated target. They should be taught to distinguish, from a prone position, distant objects, particularly troops, both with the naked eye and with field glasses. Similarly, they should be trained in estimating distances.

NIGHT MOVEMENTS.

1582. Movements at night or in heavy fog require especial practice. Order, silence, and skill in maintaining direction are the principal requisites. Practice should be had in accustoming the eye and ear to the different impressions which objects and sounds make under night conditions. Estimation of distance by eye and of direction and distance of sounds should be practiced. Exercises should be conducted in orientation by means of objects whose location has been observed during the day, by the stars, and by the use of the compass. The soldier should be instructed as to the conduct to be observed in case the enemy sets up flares in his vicinity. He must be taught to secure his arms and equipment so that they make no noise.

By the use of colored glasses, night conditions may be simulated during daylight hours; this procedure has the advantage that it permits the instructor to observe closely the movements of the men under instruction.

1583. The soldier should be instructed in the passage of obstacles, wire cutting, and the laying out of panels.

Sec. III.—SCHOOL OF THE PLATOON.

1584. The platoon at full strength comprises a platoon headquarters and six squads.

The platoon headquarters comprises one commissioned officer (platoon leader), one platoon petty officer, two petty officers (platoon guides), two additional petty officers, and four enlisted men (runners).

1585. The platoon in line is formed in double rank (fig. 133). It is divided into squads of four files each, beginning with the right flank. Platoons of more than three squads are divided into two sections. If the number of squads in the platoon is even, the sections comprise an equal number of squads; if the number of squads is odd, the right section is the stronger.

The two petty officers of platoon headquarters (platoon guides) act as section leaders, the two petty officers as section guides.

1586. In each platoon, men are arranged as far as practicable according to height from right to left, the tallest on the right. Departures from this rule are authorized for the purpose of assigning men to the duties which they are best fitted to perform, and in order to maintain the integrity of squads. If any squad contains less than six men, it is either increased to that number by transfers from other squads or from the men in the file closers, or is broken up and its members assigned to other squads and posted in the line of file closers. These squad organizations are maintained, by transfers if necessary, until the platoon becomes so reduced in numbers as to necessitate a new division into squads. No squad will contain less than six men.

For purposes of formation or drill, the runners may be used to fill blank files.

1587. Sections and squads are numbered consecutively from right to left in each platoon, and these designations do not change. For convenience in giving commands and for reference, the designations **right, center,** and **left** when in line and **leading, center, rear,**

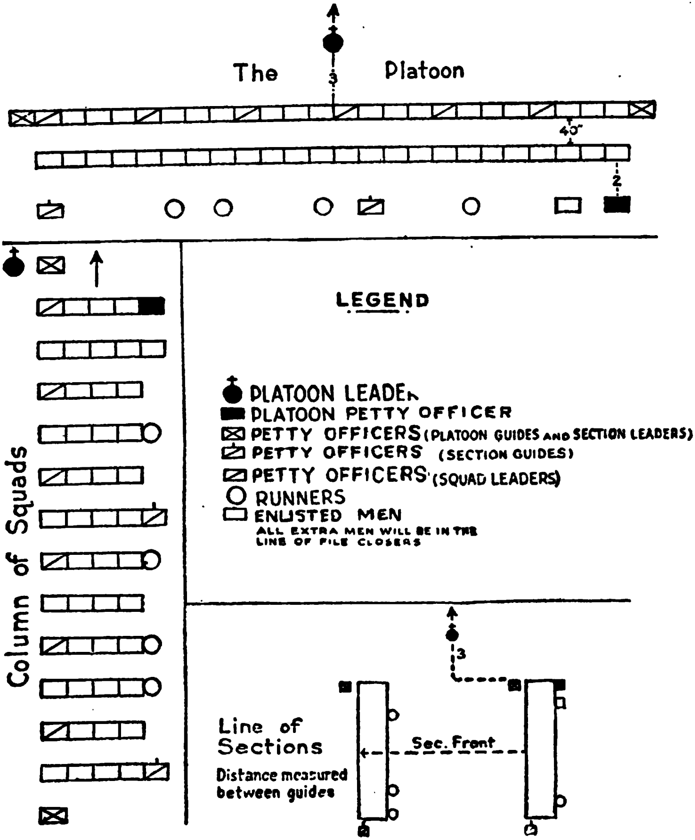

The Platoon
3
40"
2
Column of Squads
LEGEND
PLATOON LEADER
PLATOON PETTY OFFICER
PETTY OFFICERS (PLATOON GUIDES AND SECTION LEADERS)
PETTY OFFICERS (SECTION GUIDES)
PETTY OFFICERS (SQUAD LEADERS)
RUNNERS
ENLISTED MEN
ALL EXTRA MEN WILL BE IN THE LINE OF FILE CLOSERS
3
Line of Sections
Distance measured between guides
Sec. Front

FIG. 133.

when in column are applied to the actual **right**, **center**, **left**, **leading** or **rear** section or squad.

1588. The formations of the platoon are: Line, line of sections, and column of squads, twos or files. The principal close-order formations are the line and the column of squads. The line of sections is a formation taken preparatory to deployment or for purposes of the approach march.

1589. Section drills will be held for the purpose of giving section leaders an opportunity to command their sections.

1590. When the platoon is marching on roads or trails, the file closers take position at the head or rear of the column as directed by the platoon leader.

CLOSE ORDER.

Rules.

1591. The platoon executes the **halt**, **rests**, **facings**, **steps**, **and marchings**, **manual of arms**, **loadings and firings**, **takes intervals and distances and assembles**, **increases and diminishes intervals**, resumes **attention**, **obliques**, resumes the direct march, preserves alignments, **kneels**, **lies down**, **rises**, **stacks** and **takes arms**, as explained in the Schools of the Recruit and the Squad, substituting in the commands **platoon for squad.**

The same rule applies to sections, detachments, details, etc., substituting their designation for squad in the commands. In the same manner, these execute the movements prescribed for the platoon whenever possible, substituting their designations for platoon in the commands.

1592. A platoon of less than four squads is led by the platoon leader as a single section, but retains the designation of platoon. The petty officers assist in fire control; the other file closers place themselves in the skirmish line.

1593. In section movements, the post of the section guide is at the rear of the section.

1594. The guides of a column of squads place themselves on the flank opposite the file closers. To change the guides and file closers to the other flank, the platoon leader commands:

1. **File closers on left (right) flank**, 2. **MARCH**. The file closers dart through the column; the platoon leader and guides change to the other flank.

In column of squads, each rank preserves the alignment toward the side of the guide.

1595. Men in the line of file closers do not execute the loadings or firings.

Guides and enlisted men in the line of file closers execute the manual of arms during the drill unless specially excused, when they remain at the order. During ceremonies, they execute all movements. Men armed with the automatic rifle do not execute the manual of arms at either drills or ceremonies.

1596. In **taking intervals and distances,** unless otherwise directed, the right and left guides, at the first command, place themselves in the line of file closers, and with them, take a distance of 4 paces from the rear rank. In taking intervals, at the command **march,** the file closers face to the flank, and each steps off with the file nearest him. In **assembling,** the guides and file closers resume their positions in line.

1597. In movements executed simultaneously by sections (as **sections, column right**), section leaders repeat the preparatory command (**column right,** etc.), applicable to their respective sections. The command of execution is given by the platoon leader only.

Alignments.

1598. The alignments are executed as prescribed in the School of the Squad, the guide being established instead of the flank file. The rear-rank man of the flank file keeps his head and eyes to the front and covers his file leader.

At each alignment, the platoon leader places himself in prolongation of the line, 2 paces from and facing the flank toward which the dress is made, verifies the alignment, and commands **FRONT**. The rear-rank man and the guide on the flank away from the direction of dress do not bring up their arms.

Line.

1599. Being in line, to turn the platoon: 1. **Platoon right (left),** 2. **MARCH,** 3. **Platoon,** 4. **HALT**; or, 3. **Forward,** 4. **MARCH.**

At the second command, the right-flank man in the front rank faces to the right in marching and marks time; the other front-rank men oblique to the right, place themselves abreast of the pivot, and mark time. In the rear rank, the third man from the right, followed in column by the second and first, moves straight to the front until in rear of his front-rank man, when all face to the right in marching and mark time; the remaining men of the rear rank move straight to the front 4 paces, oblique to the right, place themselves abreast of the third man, cover their file leaders, and mark time. The right guide steps back, takes post on the flank, and marks time.

The fourth command is given when the last man arrives on the line.

The command halt may be given at any time after the movement begins; only those halt who are in the new position. Each of the others halts upon arriving on the line, aligns himself to the right, and executes **front** without command.

1600. Being in line, to change direction: 1. **Right (left) turn,** 2. **MARCH,** 3. **Forward,** 4. **MARCH.**

Executed as described in the School of the Squad, except that the men do not glance toward the marching flank and that all take the full step at the fourth command. The right guide is the pivot of the front rank. Each rear-rank man obliques on the same ground as his file leader.

1601. Being in line, to form column of squads:

1. **Squads right (left),** 2. **MARCH**; or, 1. **Squads right (left),** 2. **MARCH,** 3. **Platoon,** 4. **HALT.**

Executed by each squad as prescribed in the School of the Squad.

The file closers take posts on the pivot flank, abreast of and 4 inches from the nearest rank.

1602. Being in line, to form column of squads and change direction: 1. **Squads right (left), column left (right),** 2. **MARCH**; or, 1. **Right (left) by squads,** 2. **MARCH.**

In the first case, the right squad initiates **column left** as soon as it has completed the **squad right.**

In the second case, at the command **march,** the right squad marches **forward**; the remainder of the platoon executes **squads right, column left,** and follows the right squad. The right guide, when he has posted himself in front of the right squad, takes four short steps, then resumes the full step; the right squad conforms.

Column of Squads.

1603. Being in column of squads, to change direction: 1. **Column right (left),** 2. **MARCH.**

At the second command, the front rank of the leading squad turns to the right on moving pivot as in the School of the Squad; the other ranks, without command, turn successively on the same ground and in a similar manner.

1604. Being in column of squads, to form line to the front: 1. **Right (left) front into line**, 2. **MARCH**, 3. **Platoon**, 4. **HALT**, 5. **FRONT**.

At the second command, the leading squad moves straight forward; the rear squads execute right oblique.

The command **halt** is given when the leading squad has advanced the desired distance; it halts; its leader then commands: **Left dress.** Each of the rear squads, when opposite its place in line, resumes the original direction at the command of its leader. Each is halted on the line at the command of its leader, who then commands: **Left dress.** All dress on the first squad in line.

1605. Being in column of squads, to form line to a flank: 1. **Squads right (left)**, 2. **MARCH.**

Executed by each squad as described in the School of the Squad.

If the platoon be formed in line toward the side of the file closers, they dart through the column and take posts in rear of the platoon at the second command.

1606. Being in column of squads, to form line on right or left: 1. **On right (left) into line**, 2. **MARCH**, 3. **Platoon**, 4. **HALT**, 5. **FRONT**.

At the first command the leader of the leading squad commands: **Right turn.** The leaders of the other squads command; **Forward**, if at a halt. At the second command the leading squad turns to the right on moving pivot. The command **halt** is given when the leading squad has advanced the desired distance in the new direction. It halts; its leader then commands: **Right dress.**

The squads in rear continue to march straight to the front; each, when opposite the right of its place in line, executes right turn at the command of its leader. Each is halted on the line at the command of its leader, who then commands **Right dress.** All dress on the first squad in line.

If executed in double time, the leading squad marches in double time until halted.

1607. Being in column of squads, to form line of sections to the right (left): 1. **Sections, column right (left)**, 2. **MARCH.**

Executed by each section as described for the platoon.

1608. Being in column of squads, to form line of sections to the front: 1. **Line of sections (so many paces)**, 2. **Right (left)**, 3. **MARCH**, 4. **Platoon**, 5. **HALT**.

At the third command, the leading section moves straight to the front or in the direction indicated by the platoon leader; it halts at the fifth command. The rear section is conducted in column

1621½. Marching by twos or files can not be executed without serious delay and waste of road space. Every reasonable precaution will be taken to obviate the necessity for these formations in route columns. They find their principal application as approach formations in the zone of hostile artillery fire.

EXTENDED ORDER.

Rules for Deployments.

1622. All deployments are executed from column of squads, twos, or files, or from section or squad columns.

1623. The platoon must be so instructed that it is able to deploy in any direction, in silence, and in order.

1624. The direction may be designated prior to deployment, at the same time as the command for deployment, or after completion of the deployment. The direction may be indicated by designating a prominent point of the terrain (e. g., windmill, building, lone tree) or by signal. If the deployment is to be made in a direction varying greatly from the direction of the advance, the platoon must change direction before deploying. If no direction be designated, the platoon deploys straight to the front. Where an advance is to take place on assigned direction lines for long continued periods, a distant direction point and compass bearing are designated after deployment.

1625. The leading squad is the base of deployment. It remains the base of movement after deployment, unless another squad is designated by the platoon leader. In the base platoon of the company, the center squad of the leading wave is ordinarily designated as the base of the platoon; in other platoons, the base squad is as a rule the squad on the flank toward the base platoon of the company.

1626. Deployed platoons preserve a general alignment toward, and maintain interval from, the base squad within their respective fronts; individuals or squads march so as best to secure cover or facilitate the advance. Where distant direction points and compass bearings have been designated, each platoon marches in the designated direction, selecting successive points on the compass bearing or in line with the distant direction point, and moves abreast of the base platoon; intervals are automatically preserved by observance of the assigned direction. Any discrepancy in direction is, however, adjusted on the base platoon. Where it is impracticable to assign direction lines for long periods in advance, as will ordinarily be the case in open warfare, both intervals and progress will be adjusted on the base platoon.

1627. Except in case of darkness or heavy fog, platoon and section leaders deploy, assemble, and maneuver their units as far as practicable by arm signals.

Whistle signals must be sparingly used. When employed preliminary to a command during the advance into action, they give warning to the enemy of our approach, and when used to initiate a rush in the presence of the enemy, they betray to him the fact that a movement is about to commence. In general, their use should be limited to moments during the fire fight when on account of the noise of battle, it is impossible to attract the attention of the skirmishers by other means.

The habitual use of the whistle as a preliminary to a command is prohibited.

1628. A deployed platoon or section advances, halts, moves by the flank or to the rear, obliques, resumes the direct march, passes from quick to double time and the reverse by the same commands and in a similar manner as in close order; if at a halt, the movement by the flank or to the rear is executed by the same commands as when marching. Changes in the direction of march are usually effected by the assignment of a new march direction to the base squad; skirmishers place themselves on the new front by gradual obliques and by opening out from, or closing in on, the base.

Movement may be interrupted by the commands **halt, lie down,** or **range.** On halting, a deployed line faces to the front (direction of the enemy) in all cases. If halted by the command **lie down,** skirmishers take cover; if halted by the command **range** (or **battle-sight**), they occupy a position on approximate line with the platoon leader and place themselves in instant readiness for firing.

1629. At the command for deployment, runners join the platoon leader; when the platoon deploys as an element in the combat formation of the company, one runner joins the company commander. When the platoon is in movement, the platoon leader is always on the side of the platoon toward the enemy. When the platoon is halted in a firing position, he is either in the skirmish line or in rear of it; when otherwise halted, he remains in front of his platoon. He is not bound to a fixed post in front of his platoon but must not move so far to the front as to lose control over it. The post of the platoon p. o. is in rear of the center of the leading wave. During forward or flank movements, section leaders are on the side of the section toward the enemy. During movements to the rear, they are on the side opposite to the enemy. When their sections are halted in a firing position, they are either in the skirmish line or in rear of it. When otherwise halted, they are in front of their sections. Section guides are always on the side of the section opposite to the enemy generally near the center of their sections.

1630. In each squad, two selected men are especially trained as scouts; of these, one man is permanently designated as scout. Scouts move out in front of their sections and cover the advance when so directed by the platoon leader; when necessary, they may be reinforced by the alternate scout of one or more squads. When scouts are sent out to a considerable distance (300–500 yards) in front of the platoon, they should operate as a patrol deployed at wide intervals, under a designated leader.

1631. The assembly formation is always column of squads unless otherwise directed by the platoon leader.

Deployments.

1632. Being in column of squads, twos, or files, or section columns, to deploy as skirmishers:

1. **As skirmishers**, 2. **MARCH.**

The petty officer of the leading squad moves in quick time straight to the front or in the direction indicated by the platoon leader. The leading squad deploys abreast of its petty officer (par. 1547). The center and rear squads of the leading section deploy abreast of the leading squad, the center squad on its right, the rear squad on its left, men running individually toward their places on the line as soon as disengaged from column. If the leading section consists of only two squads, the rear squad deploys on the right of the leading squad.

The rear section deploys abreast of its leading squad and parallel to the line of the leading section as described for that section, the leading squad deploying in place. Unless otherwise directed by the platoon leader, the rear section gains a distance of approximately 50 paces from the leading section, standing fast or moving to the rear after deployment if necessary; if the platoon advances, the rear section follows the leading section, modifying its distance as required by considerations of cover.

The platoon petty officer, section leaders and guides, and runners take their prescribed posts.

Scouts of the leading section move forward 150 yards (or a specially designated distance or to a specially designated line) in front of their sections when so directed by the platoon leader ("Scouts out").

Squads may be deployed on one flank only of the leading squad of each section by the command: 1. **As skirmishers, right** (left), 2. **MARCH.** Executed as above described, except that in each section the squads in rear of the leading squad of the section deploy on the right and abreast of the leading squad of the section.

One section only may be deployed by the command: 1. (**Such**) **Section,** 2. **As skirmishers right** (left), 3. **MARCH.**

Executed by the designated section as above described for the leading section.

1633. Being in column of squads, twos, or files, to deploy in line of squad columns: 1. **Squad columns,** 2. **MARCH,** or 1. **Squad columns, right** (left), 2. **MARCH.**

Executed as prescribed in paragraph 1632, except that each squad if not already in column of files, executes left by file and follows its leader; leaders of squads in rear of the leading squad of each section conduct their squads in double time to their places abreast of the leading squad of the section.

The formation in **line of squad columns** may be combined with **line of skirmishers** by appropriate commands; example: 1. **First Section, as skirmishers,** 2. **Second Section, squad columns,** 3. **MARCH.**

Distance between men in squad columns is such as will permit ease in marching.

1634. Section columns are sections in column of twos; the sections are disposed with reference to each other abreast, in column with distance between sections, in echelon, or other formation required by the terrain or available cover, as directed by the platoon leader. When section or squad columns are formed in echelon or other irregular formation, they regulate their march on the most advanced unit.

Section columns may be formed from close-order formation by forming column of twos in accordance with the principles of close order and disposing the sections in such manner as the situation may require. If the sections are to be disposed abreast, the platoon should be formed in line of sections as described in paragraphs 1607 and 1608. Easy marching distances between men in section columns are maintained.

1635. Being in skirmish line, to form line of squad columns: 1. **Squad columns,** 2. **MARCH.**

Each squad leader moves to the front; the members of each squad oblique at a run toward their squad leader and follow him in single file at easy marching distances.

1636. Being in line of squad columns, to form line of skirmishers: 1. **As skirmishers**, 2. **MARCH**.

Each squad deploys, the skirmishers forming in the same relative order as in deployment from close-order formation.

1637. Being in line of skirmishers or squad columns, to form section columns: 1. **Section columns**, 2. **MARCH**.

Section leaders move forward in front of their sections. Men move individually at a run toward their section leader and assemble by squad in column of twos in his rear, squads in the same relative order as in normal formation of the section in close order, p. o.'s. at the head of their squads.

Section guides follow in rear of their respective sections to insure the prompt and orderly execution of the advance.

1638. Intervals between skirmishers are increased or decreased from or toward the base squad, as described in the School of the Squad.

The Assembly.

1639. Being in skirmish line, to assemble the platoon:

The platoon leader takes post at, or designates, the point at which the platoon is to assemble and signals: 1. **Assemble**, 2. **MARCH**.

The platoon assembles in column of squads, in the same relative order as in the normal formation of the platoon in close order (right in front).

The leading squad assembles as prescribed in the School of the Squad at the designated point. Men of other squads move individually at a run toward the assembly point, p. o.'s placing themselves in their normal position in column of squads in rear of the p. o. of the leading squad, each squad assembling on its p. o. Section leaders, guides, and runners take their prescribed posts.

If assembled by squads or sections or in section or squad columns, these are conducted to the assembly point and formed in their normal relative order by squad or section leaders.

Sections may be assembled by the command:

1. **Sections, assemble**, 2. **MARCH**.

Executed by each section as prescribed for the platoon.

Squads may be assembled by the command:

1. **Squads, assemble**, 2. **MARCH**.

Executed by each squad as described in the School of the Squad.

One section or one or more squads may be assembled by the command:

1. **(Such) Section** (or **Squad(s)**), **assemble,** 2. **MARCH.**

Advance by Rushes.

1640. Being in skirmish line, to advance by rushes:

The platoon leader indicates the line or cover to be reached, if practicable, and commands:

1. **By section** (**squad, four men, etc.**) **from the right** (**left**), 2. **RUSH.**

The leader of the indicated fraction gives the commands:

1. **Cease firing,** 2. **PREPARE TO RUSH.** The men of the fraction indicated cease firing, and hold themselves in readiness to spring forward instantly, taking care not to betray to the enemy by any movement of the body or the rifle the fact that a rush is about to take place. Each man takes his rifle in his left hand, supports himself on his right hand, draws up the right knee close to the body without raising the trunk from the ground. When ready, the leader of the rush commands **UP**, the leader and his men spring to their feet and, running at top speed, gain the new position, where they throw themselves on the ground and open fire. The leader of the rush selects the new line if it has not been previously designated.

The first fraction having established itself on the new line the next like fraction is sent forward by its section leader, without further command of the platoon leader, and so on, successively, until the entire wave is on the line established by the first rush. The platoon leader may direct that successive fractions execute the rush only upon his signal.

A rear wave advances to the position vacated by the leading wave, or remains in its original position, or otherwise maneuvers according to circumstances, as directed by the platoon leader or on the initiative of the section leader.

1641. When the leading wave comprises more than one section the rush of the wave as a whole is conducted by the platoon leader, as described for a section in the preceding paragraph. The platoon leader leads the rush; section leaders lead their respective sections. In order to obtain full advantage of the effect of surprise, the fraction initiating the rush should be as large as possible.

Advance by Infiltration.

1642. Being in skirmish line, to cross open, fire-swept areas by independent advances of individuals or squads.

The platoon leader commands:

1. **On (such line, e. g., crest, hedge, road, etc.),** 2. **RE-FORM.**

Each squad leader decides on the best method of reaching the designated line, whether by leading the squad as a whole along a covered route or by men working their way forward individually.

The platoon leader must recover control over his platoon at the designated position before attempting a further advance.

This method of advance finds especial application at long range or when the source of hostile fire can not be discovered and beaten down.

FIRE.

1643. Ordinarily pieces are loaded and extra ammunition is issued before the platoon deploys for combat.

In close order, the platoon executes the firings at the command of the platoon leader, who posts himself in rear of the center of the platoon.

Usually the firings in close order consist of saluting volleys only.

1644. When the platoon is deployed, the men execute the firings at the command of the platoon leader as long as this is possible; when the platoon is deployed over an extensive front with both sections in the first line, firings will ordinarily be executed at the command of section leaders. They give such commands as are necessary to carry out the platoon leader's directions, and from time to time add such further commands as are necessary to continue, correct, and control the fire ordered.

1645. The voice is frequently inadequate for giving commands during fire and must be replaced by signals of such character that proper fire control is assured. To attract attention, signals must often be preceded by the whistle signal (short blast). A fraction of the firing line about to rush should avoid using the whistle signal as an aid to cease firing. Officers and men behind the firing line can not ordinarily move freely along the line, but must depend on mutual watchfulness and the proper use of the prescribed signals. All should post themselves so as to see their immediate superiors and subordinates. Squad leaders, and when necessary the skirmishers, transmit orders along the skirmish line by word of mouth, stating the source of the order.

1646. Runners or other designated observers assist the platoon leader by observing the enemy, the target, and the fire effect, by transmitting commands or signals, and by watching for signals.

Ranges.

1647. For convenience of reference, ranges are classified as follows:

0 to 600 yards, close range,
600 to 1,200 yards, mid range,
1,200 to 2,000 yards, long range,
2,000 yards and over, distant range.

1648. During an advance, it is ordinarily impracticable to ascertain the effect of rifle fire from observation of the strike of the bullets, and to correct the unavoidable errors in range estimation at mid and long ranges. On the other hand, the close grouping of the fire of machine guns makes practicable the observation and correction of their fire. Fire at mid and long ranges during an advance should therefore be reserved to the machine guns, except where especially favorable targets such as bodies of hostile troops in close order offer themselves.

On the defensive, more accurate knowledge of ranges will permit of effective rifle fire at mid ranges.

Classes of Fire.

1649. Volley fire has limited application. In defense, it may be used in the early stages of the action, if the enemy presents a large compact target. It may be used by troops executing **fire of position.** When the ground near the target is such that the strike of bullets can be seen from the firing line, **ranging volleys** may be used to correct the sight setting.

In combat, volley firing is executed habitually by platoon or section.

1650. **Fire at will** is the class of fire normally employed in attack and defense.

1651. **Clip fire** has limited application. It is principally used: (1) In the early stages of combat, to steady the men by habituating them to brief pauses in firing; (2) to produce a short burst of fire.

The Target.

1652. Where practicable, the company commander distributes the objective among his platoons at the initial firing position. Otherwise, each platoon leader takes as his target that part of the company objective which corresponds to his position in the company.

1653. The platoon will, however, be able to limit its fire to its assigned objective in rare cases. Inequality in the advance of different units will expose the flanks of advanced elements to enfilade fire. Points of resistance on the flanks must be dealt with by the flank elements, particularly the automatic rifles, and by units from the second wave. Mutual support of adjacent platoons will also require fire on objectives of other units. Wherever practicable, the platoon leader will assign such objectives to flank elements of his platoon or to units of the second wave; when necessary, squad or section leaders act on their own initiative.

Fire Control.

1654. The platoon leader selects the target, announces the range, and gives the commands for opening fire as long as this is possible in combat. When the ability of the platoon leader to control the fire of his platoon ceases, section and squad leaders control the fire of their units on their own initiative.

1655. As long as the platoon leader retains power to control the fire of his platoon, it is the duty of section leaders to observe the target and remain on the alert for the platoon leaders commands or signals; they observe and regulate the rate of fire. Section guides watch the firing line and check every breach of fire discipline. Squad leaders transmit commands and signals, when necessary, observe the conduct of their squads, assist in enforcing fire discipline, and participate in the firing.

Fire control implies the ability to open simultaneous fire, to stop firing, change the sight setting and target, and resume a well-directed fire.

Fire Discipline.

1656. Fire discipline implies the exact execution of orders and careful observance of instructions relative to the use of the rifle and to conduct in action. It implies care in sight setting, aim, trigger squeeze, constant observation of the enemy, close attention to the leader, independent increase in the rate of fire when the target becomes more favorable, cessation of fire when the enemy disappears, and economy in ammunition. It also implies that when the fire control of leaders becomes impracticable, each man will act on his own initiative and select sight setting and target independently.

To stimulate the initiative of the skirmishers, frequent exercises in which leaders are lacking should be carried out.

1657. In an advance by rushes, leaders of troops in firing positions are responsible for the delivery of heavy fire to cover the advance of each rushing fraction. Troops are trained to change slightly the direction of fire so as not to endanger the flanks of the advanced portions of the firing line.

1658. In defense, when the target disappears behind cover, platoon leaders suspend fire, prepare their platoons to fire upon the point where it is expected to reappear, and greet its reappearance instantly with vigorous fire.

Sec. IV.—SCHOOL OF THE COMPANY.

1659. From the viewpoint of training, the c. c. is the most important commander of the arm upon which the decision in battle depends—the infantry. It is his task to develop in his men patriotism, soldierly virtues, and the desire to close with the enemy. He must make his men efficient fighters, and his platoon leaders and p. o.'s. capable and aggressive leaders.

1660. The c. c. is responsible for the theroretical and practical instruction of his officers and p. o.'s, not only in the duties of their respective grades, but in those of the next higher grades.

He must be careful not to curtail the initiative of his subordinates by unnecessary interference. In general, while giving them thorough instruction in the methods of training and command, he should accord them the same degree of initiative in the performance of tasks that he will be compelled to give them in the execution of combat missions.

1661. The company at full strength comprises four platoons of six squads each and company headquarters. This organization will be maintained until the number of complete squads in the company falls below twelve. A company of less than twelve and more than eight squads will be organized into three platoons; one of less than nine and more than five squads into two platoons. Within these limits the permanency of platoons will be maintained and transfers of personnel between platoons avoided as far as practicable.

The administration of the interior economy of the company will be based upon platoon and squad orgaization.

1662. The formations of the company are: Line, column of platoons (at full distance or in close column), line of platoons (at full or close intervals), and column of squads. Of these formations the first two are assembly, ceremonial, and drill formations; they have no application to field service or deployments. In close-order drill, the formation in line is exceptional; column of platoons will be habitually employed for drilling troops in marching in line. The column of squads and line of platoons (modified according to conditions) are employed on the march, in the advance into action, and in deployments for attack or defense.

1663. The company assembles in formation, in line or close column of platoons, as directed by the c. c. or higher commanders (Figs. 134 and 135).

1664. At the formation of the company in line, the platoons are numbered consecutively from right to left, and these designations do not change.

For convenience in giving commands and for reference the designations, **right, center, left,** when in line, and **leading, center, rear,** when in column, are applied to platoons. These designations apply to the actual right, left, center, head, or rear, in whatever direction the company may be facing. The center platoon is the actual center or right center platoon of the company. The designation "So-and-so's" platoon may also be used.

1665. Junior officers are assigned as follows:

The senior, second in command.
2d senior, commanding first platoon.
3d senior, commanding fourth platoon.
4th senior, commanding second platoon.
The junior, commanding third platoon.

The fourth senior duty p. o.'s are assigned as assistants to platoon leaders, one with each platoon, and are designated as platoon p. o.'s. The next in rank are assigned as guides, two to each platoon; in section movements and in extended order they command sections.

The c. p. o., supply p. o., and mess p. o. are not assigned as guides.

1666. The company headquarters detachment is formed by the senior petty officer or enlisted man present, in the position shown in the plates. For purposes of instruction members of the detachment may be attached to a platoon and with the platoon runners temporarily organized into an extra squad. Such attachment must not affect the permanent squad orgainzation of the platoon.

1667. A company of less than six squads is led by the c. c. as a single platoon, but retains the designation of company. The junior officers and first p. o. command sections or assist in fire control; the other p. o.'s. place themselves in the firing line as skirmishers.

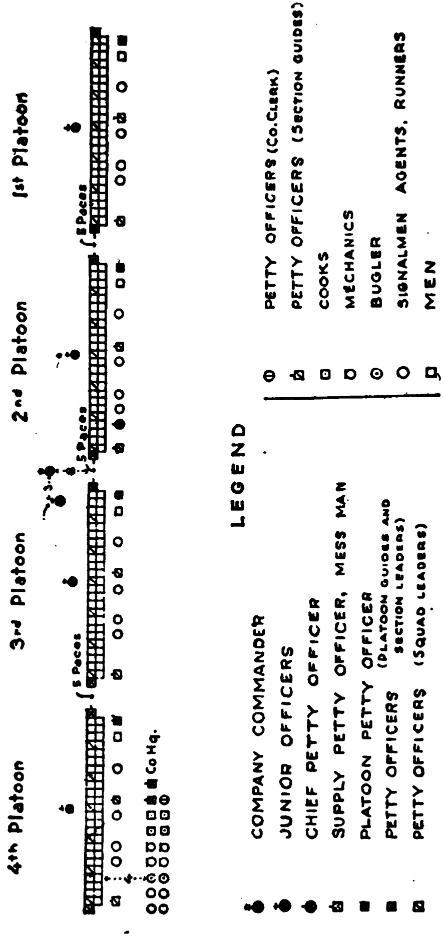
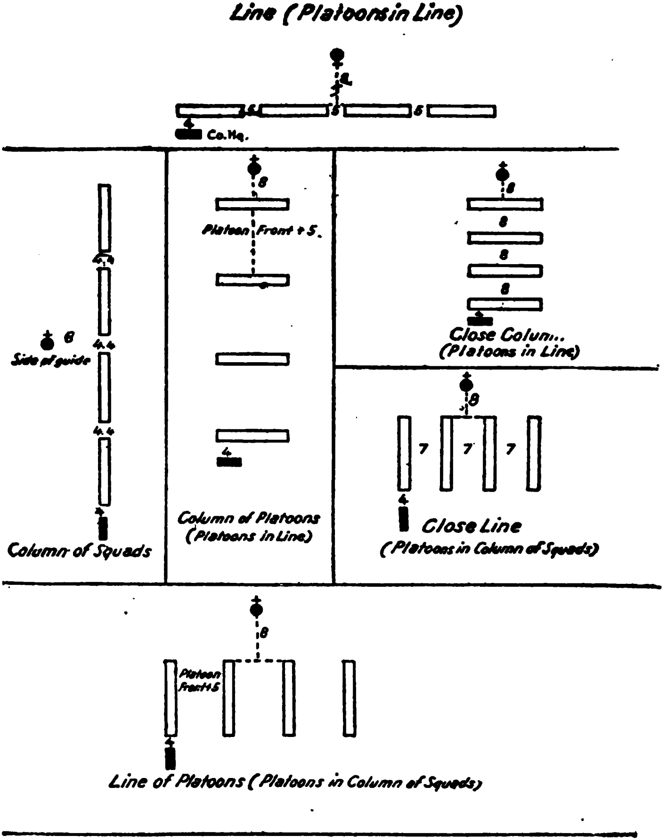

4th Platoon
3rd Platoon
2nd Platoon
1st Platoon
5 Paces
5 Paces
5 Paces
5 Paces
3
Co Hq.
LEGEND
COMPANY COMMANDER
JUNIOR OFFICERS
CHIEF PETTY OFFICER
SUPPLY PETTY OFFICER, MESS MAN
PLATOON PETTY OFFICER
PETTY OFFICERS (PLATOON GUIDES AND SECTION LEADERS)
PETTY OFFICERS (SQUAD LEADERS)
PETTY OFFICERS (CO. CLERK)
PETTY OFFICERS (SECTION GUIDES)
COOKS
MECHANICS
BUGLER
SIGNALMEN AGENTS, RUNNERS
MEN

FIG. 134.


Line (Platoons in Line)

Column of Squads

Column of Platoons (Platoons in Line)

Close Column (Platoons in Line)

Close Line (Platoons in Column of Squads)

Line of Platoons (Platoons in Column of Squads)

Numerals are Intervals or Distances in Paces. All intervals and distances are measured between guides

FIG. 135.

CLOSE ORDER.

Rules.

1668. Platoon leaders repeat such preparatory commands as are to be immediately executed by their platoons, as **forward, squads right,** etc.; the men execute the commands **march, halt,** etc., if applying to their platoons, when given by the c. c. In movements executed in route step or at ease the platoon leaders repeat the command of execution, if necessary. Platoon leaders do not repeat the c. c's. commands in executing the manual of arms, nor those commands which are not essential to the execution of a movement by their platoons, as **column of squads, first platoon, squads right,** etc. In giving commands or cautions, platoon leaders may prefix the numbers of their platoons, as **first platoon, HALT; second platoon, squads right,** etc.

1669. At the command **guide center** (**right** or **left**), platoon leaders command: **Guide right** or **left**, according to the positions of their platoons. **Guide center** designates the left guide of the center platoon.

1670. When the platoons are to be dressed, platoon leaders place themselves on that flank toward which the dress is to be made as follows:

The company in line: Beside the guide (or the flank file of the front rank, if the guide is not in line) and facing to the front.

The company in column of platoons: Two paces from the guide, in prolongation of and facing down the line.

Each platoon leader, after dressing his platoon, commands: **FRONT**, and takes his post.

The company being in line and unless otherwise prescribed, at the platoon leader's command **dress**, or at the command **halt**, when it is prescribed that the platoon shall dress, the guide on the flank away from the point of rest, with his piece at right shoulder, dresses promptly on the platoon leader and the platoon beyond. During the dress, he moves, if necessary, to the right and left only; the platoon leader dresses the platoon on the line thus established. The guide takes the position of order arms at the command **front.**

1671. The company executes the **halt, rests, facings, steps,** and **marchings, manual of arms,** resumes **attention, kneels, lies down, rises, stacks** and **takes arms**, as explained in the Schools of the Recruit and Squad, substituting in the commands **company** for **squad.**

The company executes **squads right (left), squads right (left) about, route step** and **at ease**, and **obliques**, and resumes the **direct march** as explained in the School of the Platoon.

1672. The company in column of squads, twos, or files changes direction, in column of squads, forms column of twos or files and re-forms columns of twos or squads, as explained in the School of the Platoon.

1673. When the formation admits of the simultaneous execution by platoons of movements in the School of the Platoon, the c. c. may cause such movement to be executed by prefixing, when necessary, **platoons** to the commands prescribed therein: as 1. **Platoons, right front into line,** 2. **MARCH.** To complete such simultaneous movements, the commands **halt** or **march,** if prescribed, are given by the c. c. The command **front,** when prescribed, is given by the platoon leaders.

1674. The company as a unit executes the loadings and firings only in firing saluting volleys. The commands are as for the platoon, substituting **company** for **platoon.** At the first command for loading, platoon leaders take post in rear of the center of their respective platoons. At the conclusion of the firing, they resume their posts in line.

On other occasions, when firing in close order is necessary, it is executed by platoons or other subdivisions under instructions from the company commander.

To Form the Company.

1675. The company c. p. o. takes position 6 paces in front of the point where the center of the company is to be, faces it, and commands: **FALL IN.**

The right guide of the first platoon places himself, facing to the front, where the right of the platoon is to rest, and at such point that the center of the company or the leading platoon will be 6 paces from and opposite the company c.p. o.; right guides of other platoons place themselves successively at prescribed interval; or distance from the right guide of the first platoon; platoon p. o's. take post 3 paces in front of the point where the center of their platoons will be; the platoons form in their proper places, superintended by the platoon p. o's. and guides. (See plates.)

The platoon p. o's. then command: **REPORT.** Remaining in position at the order, the squad leaders, in succession from the right, in each platoon, salute and report: "**All present;**" or "**— absent.**"

The platoon p. o's. do not return the salute of the squad leaders; they then command: 1. **Inspection**, 2. **ARMS**, 3. **Order**, 4. **ARMS**, face about, and at the command report, given by company c. p. o., salute company c. p. o. and beginning with the first platoon, successively report: "**(first, second, etc.,) Platoon, present or accounted for**," or the number of the unauthorized absentees.

All platoons and the headquarters detachment, having reported, the company c. p. o. commands: **POSTS**, and the platoon p. o.'s. take posts. The company c. p. o. then faces about, salutes the c. c., and reports: "**Sir, all present or accounted for**," or, "**Sir, — men are absent**," and without command takes his post.

The company c. p. o. returns the salute of the platoon petty officers.

If the platoons can not be formed by squads, the platoon p. o. commands: 1. **Inspection**, 2. **ARMS**, 3. **Right shoulder**, 4. **ARMS**, and calls the roll. Each man, as his name is called, answers **here** and executes order arms. The platoon p. o. then effects the division into squads and reports the platoon as prescribed above.

The c.. c. places himself 12 paces in front of the center of, and facing, the company or the leading platoon in time to receive the report of the company c. p. o., whose salute he returns.

The platoon leaders take their posts when the company c. p. o has reported.

The p. o. or enlisted man in charge of the company headquarters detachment forms the detachment and reports as prescribed for the platoon petty officers.

The company, not under arms, is formed in like manner, omitting reference to arms.

To Dismiss the Company.

1676. Being in line or close column at a halt, the c. c. directs the c. p. o.: **Dismiss the company**. The officers fall out; the c. p. o. moves 6 paces in front of the center of the company or the leading platoon, salutes, faces toward the company, and commands: 1. **Inspection**, 2. **ARMS**, 3. **Port**, 4. **ARMS**, 5. **DISMISSED**.

The c. c. returns the salute of the chief petty officer.

Dismissal may also take place by directions to the platoon leaders; the c. c. commands: **Dismiss your platoons**. Each platoon is then dismissed as described for the company, the platoon p. o. performing the duties described for the c. p. o. The headquarters detachment is dismissed by its leader.

To Rectify the Alignment.

1677. Being in line at a halt, to align the company: 1. **Center (right or left)**, 2. **DRESS.**

The platoon leaders dress their platoons successively toward the center (right or left) guide of the company, each as soon as the platoon leader next toward the indicated guide commands: **Front.** The platoon leaders of the center platoons (if the dress is center) dress them without waiting for each other.

1678. To give the company a new alignment: 1. **Guides center (right or left) platoon on the line**, 2. **Guides on the line**, 3. **Center (right or left)**, 4. **DRESS**, 5. **Guides**, 6. **POSTS.**

At the first command, the designated guides place themselves on the line facing the center (right or left). The company commander establishes them in the direction he wishes to give the company.

At the second command, the guides of the other platoons take post, facing the center (right or left), so as to prolong the line.

At the command **dress**, each platoon leader dresses his platoon to the flank toward which the guides of his platoon face.

At the command **posts**, given when all platoons have completed the dress, the guides return to their posts.

To Rectify the Column.

1679. Being in column of platoons or in close column, at a halt, if the guides do not cover or have not their proper distances, and it is desired to correct them, the company commander commands: 1. **Right (left)**, 2. **DRESS.**

Leaders of platoons in rear of the leading platoon place their right guides so as to cover at the proper distance; each platoon leader aligns his platoon to the right and commands: **FRONT.**

On Right (Left) into Line.

1680. Being in column of squads or platoons: 1. **On right (left) into line**, 2. **MARCH**, 3. **Company**, 4. **HALT.**

Being in column of squads: At the first command, the leader of the leading platoon commands: **Squads right.** If at a halt, each platoon leader in rear commands: **Forward.** At the second command, the leading platoon marches in line to the right; the platoons in rear continue to march to the front and form successively on the left, each, when opposite its place, being marched in line to the right.

The fourth command is given when the leading platoon has advanced the desired distance in the new direction; it halts and is dressed to the right by its leader. The others complete the movement, each being halted 1 pace in rear of the line established by the leading platoon, and then dressed to the right.

Being in column of platoons: At the first command, the leader of the leading platoon commands: **Right turn**. If at a halt, each platoon leader in rear commands: **Forward**. Each of the platoon leaders in rear of the leading platoon gives the command: 1. **Right turn**; in time to add, 2. **MARCH**, when his platoon arrives opposite the right of its place in line.

The fourth command is given and the movement completed as explained above.

Whether executed from column of squads or column of platoons, each platoon leader places himself so as to march beside the right guide after his platoon forms line or changes direction to the right.

If executed in double time, the leading platoon marches in double time until halted.

Front into Line.

1681. Being in column of squads or platoons: 1. **Right (Left) front into line**, 2. **MARCH**.

Being in column of squads: At the first command, the leader of the leading platoon commands: **Column right**; the leaders of platoons in rear, **column half right**. At the second command, the leading platoon executes **column right**, and as the last squad completes the change of direction, is formed in line to the left, halted, and dressed to the left. Each of the platoons in rear is conducted by the most convenient route to the rear of the right of the preceding platoon, thence to the right, parallel to and 1 pace in rear of the new line; when opposite its place, it is formed in line to the left, halted, and dressed to the left.

Being in column of platoons: If marching, the leader of the leading platoon gives the necessary commands to halt his platoon at the second command; if at a halt, the leading platoon stands fast. At the first command, the leader of each platoon in rear commands: **Squads right**, or **Right by squads**, and after the second command conducts his platoon by the most convenient route to its place in line, as described above.

Whether executed from column of squads or column of platoons, each platoon leader halts when opposite or at the point where the left of his platoon is to rest.

To Form Column of Platoons Successively to the Right or Left.

1682. Being in column of squads: 1. **Column of platoons, First (Fourth) Platoon, squads right** (left), 2. **MARCH**.

The leading platoon executes **squads right** and moves forward. The other platoons move forward in column of squads and successively march in line to the right on the same ground as the leading platoon and in such manner that the guide covers the guide of the preceding platoon.

To Form Column of Squads Successively to the Right or Left.

1683. Being in column of platoons: 1. **Column of squads, First (Fourth) Platoon, squads right** (left), 2. **MARCH**.

The leading platoon executes **squads right** and moves forward. The other platoons move forward in column of platoons and successively march in column of squads to the right on the same ground as the leading platoon.

To Change Direction.

1684. Being in column of platoons or close column: 1. **Column right (left)**, 2. **MARCH**.

The leader of the leading platoon commands: **Right turn.**

The leading platoon turns to the right on moving pivot, the platoon leader adding: 1. **Forward**, 2. **MARCH**, upon its completion.

The other platoons march squarely up to the turning point; each changes direction by the same commands and means as the first and in such manner that the guide covers the guide of the preceding platoon.

1685. Being in line of platoons or close line: 1. **Company right (left)**, 2. **MARCH**, 3. **Company**, 4. **HALT**.

The right platoon changes direction to the right; the other platoons are conducted by the shortest line to their places abreast of the first.

The fourth command is given when the right platoon has advanced the desired distance in the new direction; that platoon halts; the others halt successively upon arriving on the line.

1686. Being in column of squads, the company changes direction by the same commands and in the manner prescribed for the platoon.

Mass Formations.

1687. Being in line of platoons: 1. **Close on First (Fourth) Platoon,** 2. **MARCH,** 3. **Company,** 4. **HALT.**

At second command, the indicated platoon moves straight to the front or in the direction indicated by the c. c.; it halts at the fourth command. The other platoons are conducted toward it and successively halted in close line (Plate p).

Being in line or in column of platoons: 1. **Close on First (Fourth) Platoon,** 2. **MARCH.**

At the second command, the indicated platoon halts or stands fast. The other platoons are conducted toward it and are halted successively in close column in its rear (fig. 135).

In close column formed from line on the right platoon, the left guides cover; formed on the left platoon, right guides cover. If formed from column of platoons, the guide remains as before the formation.

Being in column of squads: 1. **Line of platoons, (so many paces),** 2. **Right (left),** 3. **MARCH,** 4. **Company,** 5. **HALT.**

At the third command, the leading platoon moves straight to the front or in the direction indicated by the c. c.; it halts at the fifth command. The other platoons are conducted in column of squads on the indicated flank and halted successively at the prescribed interval abreast of the leading platoon. To form close line, an interval of seven paces is designated. If no interval be designated, the platoons form at intervals of platoon frontage plus five paces.

To Extend the Mass.

1688. Being in close column: 1. **Extend on First (Fourth) Platoon,** 2. **MARCH.**

At the second command, the leading platoon moves straight to the front. The other platoons halt or stand fast and successively move forward in time to follow at full distance.

The extension is made on the rear platoon only.

Close column is not extended in double time.

Being in close line: 1. **Extend on First (Fourth) Platoon,** 2. **MARCH,** 3. **Company,** 4. **HALT.**

At the second command, the indicated platoon moves straight to the front or in the direction indicated by the c. c.; it halts at the fourth command.

Each of the other platoons is conducted away from the indicated platoon and is halted in its proper order in line of platoons abreast of the indicated platoon.

For special purposes, close column or close line may be formed or extended at other than normal distance or interval by designating the distance or interval (so many paces) after the preparatory command for closing or extending.

1689. Being in close column: 1. **Right** (**left**) **front into line,** 2. **MARCH.** Executed as from column of platoons.

1689½. Being in close column: 1. **Column of squads, First (Fourth) Platoon, squads right** (left), 2. **MARCH.**

The designated platoon marches in column of squads to the right. Each of the other platoons executes the same movement in time to follow the preceding platoon in column.

1690. Being in close line: 1. **Column of squads, First (Fourth) Platoon, forward,** 2. **MARCH.**

The designated platoon moves forward. The other platoons (halting if in march) successively take up the march and follow in column.

Route Step and At Ease.

1691. The company marches in **route step** and **at ease** as prescribed in the School of the Platoon. When marching in column of platoons, the guides maintain the trace and distance. In route marches, file closers march at the head, or in rear, of their platoons or the company.

Assembly.

1692. The company being wholly or partially deployed, or the platoons being separated: 1. **Assemble,** 2. **MARCH.**

The c. c. places himself opposite to or designates the element or point on which the company is to assemble. Platoons are assembled and marched to the indicated point. As the platoons arrive, the c. c. indicates the formation to be taken.

Sec. V.—THE BATTALION.

1693. The battalion being purely a tactical unit, the bn. c. duties are primarily those of an instructor in tactics and of a tactical commander. He is responsible for the theoretical and practical training of the battalion. He supervises the training of the companies of the battalion with a view to insuring the thoroughness and uniformity of their instruction.

In the instruction of the battalion as a whole, his efforts will be directed chiefly to the development of tactical efficiency, devoting only such time to the mechanism of drill and to the ceremonies as may be necessary in order to insure precision, smartness, and proper control.

1694. The formations of the battalion (fig. 136) are: **line** (companies in line), **line of close columns** (companies in close column), **close column** (companies in close column), **close line** (companies in close line), **column of close lines** (companies in close line), and **column of squads.**

The column of squads is the only formation that has any application in campaign. It is extended for approach march or combat in the formation required by the situation.

The formation in line is employed only for ceremonies in which a single battalion participates.

For ceremonies involving two or more battalions, the battalion is formed **in line of close columns, close column, close line, or column of close lines.**

1695. The companies are generally arranged from right to left according to the rank of their commanding officers. The arrangement of the companies may be varied by the bn. c. or higher commanders.

After the battalion is formed, no cognizance is taken of the relative order of the companies.

1696. In whatever direction the battalion faces, the companies are designated numerically from right to left in line, and from head to rear in column, **first company, second company,** etc.

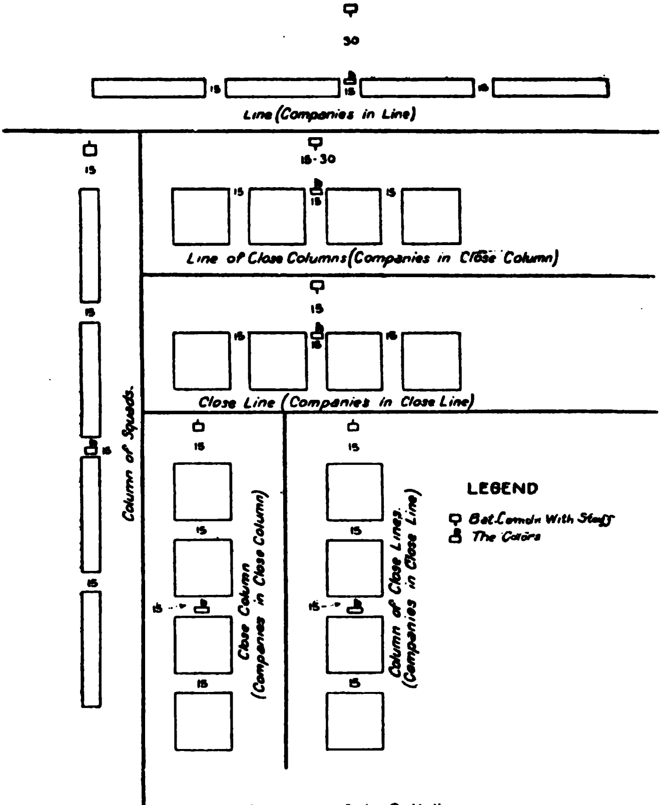
The terms right and left apply to actual right and left as the line faces; if the about by squads be executed when in line, the right company becomes the left company and the right center becomes the left center company.

The designation, center company, indicates the right center or the actual center company according as the number of companies is even or odd.

1697. The band and other special units, when attached to the battalion, take the same post with respect to it as if it were the nearest battalion shown in Figure 137.

1698. The bn. c. either gives his commands or orders orally, by bugle, or by signal, or communicates them by staff officers or orderlies.

Each c. c. gives the appropriate commands or orders, and in close-order movements, causes his company to execute the necessary


30
15
15
15
Line (Companies in Line)
15
15-30
15
15
15
Line of Close Columns (Companies in Close Column)
15
15
15
15
15
Close Line (Companies in Close Line)
Column of Squads.
15
15
15
15
15
15
15
15
15
Close Column (Companies in Close Column)
15
15
15
15
Column of Close Lines (Companies in Close Line)
LEGEND
Bat.Comdr. With Staff
The Colors

Formations of the Battalion.
Diagramatic:- Not drawn to scale
Numerals are distances or intervals in paces
All intervals and distances are measured between guides
Distance of Bat.Comdr. post in front of center of battalion in line of Close Columns: 30 paces in formations of a single battalion: 15 in formations of a Regiment or larger unit

FIG. 136.

movements at his command of execution. Each c. c. ordinarily moves his company from one formation to another in column of squads, in the most convenient manner, and, in the presence of the enemy, in the most direct manner consistent with cover.

1699. Except at ceremonies, or when rendering honors, or when otherwise directed, after the battalion is formed, the companies march and stand at ease during subsequent movements.

1700. For ordinary purposes, other than ceremonies, the battalion is formed in column of squads. For special reasons, a different formation may be prescribed by the bn. c.

The adjutant informs the c. c's. what the formation is to be. The companies and special units having been formed, the adjutant takes post. **Adjutant's call** is sounded, or the adjutant signals **assemble.**

If forming in column of squads, the adjutant posts himself so as to be facing the column when formed, and 6 paces in front of the place to be occupied by the leading guide of the battalion.

The companies are halted, at attention, in column of squads successively from the front in their proper order and places. The band, if present, takes its place when the leading company has halted. Other special units take their places in turn when the rear company has halted.

Each c. c., when his company is in place, salutes the adjutant and commands: **At ease**; the adjutant returns the salutes. When all have saluted, the adjutant proceeds to the bn. c., reports: **Sir, the battalion is formed,** and takes his post.

1701. For battalion ceremonies, or when directed, the battalion is formed in line or line of close columns.

The adjutant posts himself so as to be 6 paces to the right of the right company, or leading platoon of the right company, when the battalion is formed, and faces in the direction in which the line is to extend. **Adjutant's call** is sounded; the band plays if present. As soon as the right company has been aligned, the adjutant takes post facing the battalion midway between the post of the bn. c. and the center of the battalion.

The companies, arriving from the rear, each in line or close column, as the case may be, are halted on the line successively from right to left in their proper order and places. Upon halting each c. c. commands: 1. **Right,** 2. **DRESS.**

The band is posted by the adjutant. It ceases to play when the left company has halted.

The battalion commander and those who accompany him take post.

When all parts of the line have been dressed, and officers and all others have reached their posts, the adjutant commands: 1. **Present,** 2. **ARMS.** He then turns about and reports to the battalion commander: **Sir, the battalion is formed**; the battalion commander directs the adjutant: **Take your post, Sir,** and brings the battalion to the order. The adjutant takes his post, passing to the right of the battalion commander.

To Dismiss the Battalion.

1702. Dismiss your companies. Staff officers and petty officers fall out; each company commander marches his company off and dismisses it.

Movements of the Battalion.

1703. The column of squads is the usual column of march. To shorten the column, if conditions permit, a double column of squads may be used, the platoons of each company marching abreast in two columns. Preliminary to an engagement, the battalion or its units will be placed in the formation best suited for its subsequent tactical employment.

1704. The battalion does not engage in prescribed drills. To assume any formation, the bn. c. indicates to the c. c.'s the character of the formation desired, the order of the companies, and the point of rest. Each company is conducted by its c. c. and is placed in its proper order in the formation, by the most convenient means and route.

Having halted in a formation, no movements for the purpose of correcting minor discrepancies in alignments, intervals, or distances are made unless specially directed by the bn. c. or necessitated by the conditions of cover.

The bn. c. may employ the commands prescribed in the Schools of the Recruit, the Squad, the Platoon, and the Company, where applicable; proper substitutions in the designation of the units are made when necessary.

Sec. VI.—THE REGIMENT.

1705. These regulations are applicable to the battalions of the regiment. Special units, such as band, headquarters company, machine-gun company, and supply company, have special formations for their own use; they conform to the movements of the battalions unless otherwise prescribed.

1706. The rg. c. is responsible for the theoretical instruction and practical training of the regiment as a whole. Under his immediate supervision, the training of the units of the regiment is conducted by their respective commanders.

1707. The rg. c. gives his commands or orders verbally, in writing, by bugle, by signal, or communicates them by staff officers or orderlies. Battalion and special-unit commanders move their commands from one formation to another in the most convenient manner, subject to the considerations of the situation and terrain.

1708. During ceremonies, the reg. s. c. is posted two paces to the left of, and one pace less advanced, than the rg. c. At other times he takes position as directed by the rg. c.

1709. In whatever formation the regiment may be, the battalions retain their permanent administrative designations of **first, second, third battalion.** For convenience, they may be designated, when in line, as **right, center,** or **left battalion**; when in column, as **leading, center,** or **rear battalion.** These designations apply to the actual positions of the battalions in line or column.

1710. Except at ceremonies, or when rendering honors, or when otherwise directed, battalions and special units march **at ease** or **at route step** and stand **at ease** or **at rest.**

1711. Unless otherwise directed, the battalions are posted from right to left, or from head to rear, according to the rank of the battalion commanders, the senior on the right or at the head.

1712. The formations of the regiment (fig. 137) are: **Line of masses** (battalions in line of close columns), **line of battalion columns** (battalions in **close column**), **column of masses** (battalions in **line of close columns**), **column of battalion close lines** (battalions in **close line**), and **line of battalions in column of company close lines.**

Of these formations, the column of squads is the only one that has any application in campaign. The battalions are extended and deployed in special formations required by the situation.

The line of masses is the ordinary formation for regimental ceremonies.

The **line of battalion columns, column of masses, column of battalion close lines,** and **line of battalions in column of company close lines** are employed in ceremonies of large commands (see paragraph 2184). These formations are described for convenience in designating the method of forming large commands for ceremonies and for reference when required. They have no other value.

1713. The regiment does not engage in prescribed drills. It engages in route marches and battle or other tactical exercises. These are conducted pursuant to orders formulated to suit the conditions of the exercise. To assume any formation, the rg. c. indicates to the battalion and special-unit commanders the dispositions desired. The latter then move their commands by the most suitable means and route, and dispose them as ordered.

1714. The column of squads is the usual column of march; to shorten the column, if conditions permit, a double column of squads may be used, the platoons of each company marching abreast in two columns. Preliminary to an engagement, the regiment or its units will be placed in the formation best suited to its subsequent tactical employment.

1715. Route marches will not be preceded by a formal assembly of the regiment. Battalion and special-unit commanders will be informed of the hour of starting and the initial point, and will be responsible for having their commands in readiness to take their places in the column at the prescribed time and place. A calculation of the elements of time and space will enable commanders to determine when their commands must leave their quarters, camp, or billets in order to reach the initial point at the proper time. All commanders are strictly enjoined against ordering an assembly at such an hour as will entail any considerable waiting in ranks, either before or after arrival at the initial point.

1715a. For regimental ceremonies, the regiment is formed in line of masses.

The adjutant posts himself so as to be 6 paces to the right of the right company of the right battalion when the regiment is formed and faces in the direction in which the line is to extend. **Adjutant's** call is sounded; the band plays.

The adjutant indicates to the adjutant of the right battalion the point of rest, and the direction in which the line is to extend, and then takes post facing the regiment midway between the post of the rg. c. and the center of the regiment. Each of the other battalion adjutants precedes his battalion to the line and marks its point of rest.

The battalions, arriving from the rear, each in **line of close columns**, are halted on the line successively from right to left in their proper order and places. Upon halting, each bn. c. commands: 1. **Right**, 2. **DRESS**. The battalion adjutant assists in aligning the battalion and then takes his post.

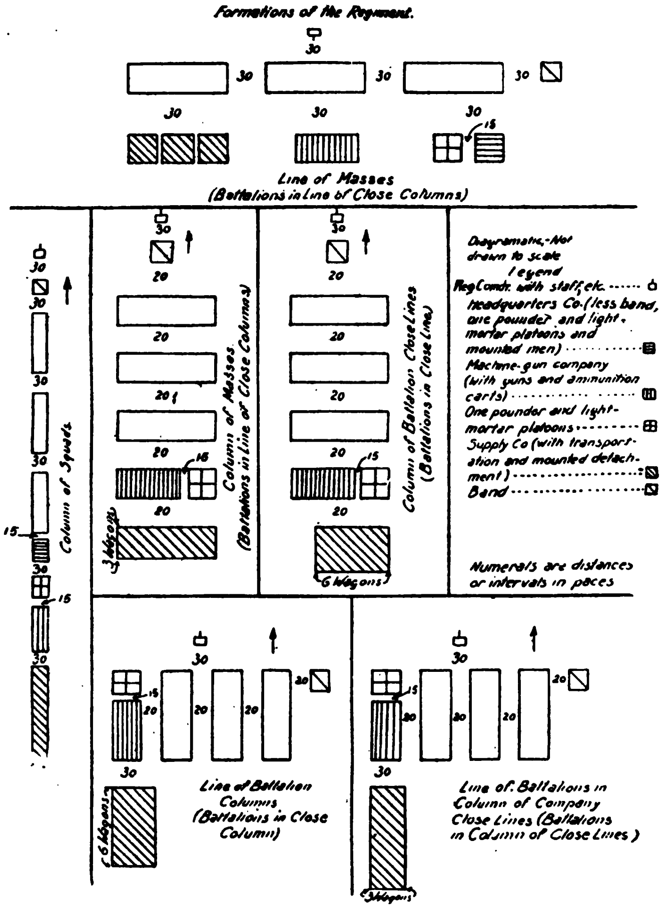

Formations of the Regiment.
Line of Masses
(Battalions in Line of Close Columns)
Column of Squads
Column of Masses (Battalions in Line of Close Columns)
Column of Battalion Close Lines (Battalions in Close Line)
Diagramatic,-Not drawn to scale
Legend
Reg Comdr. with staff, etc. ······ ⌂
Headquarters Co. (less band, one pounder and light-mortar platoons and mounted men) ········ ▤
Machine-gun company (with guns and ammunition carts) ········ Ⅲ
One pounder and light-mortar platoons ········ ⊞
Supply Co (with transportation and mounted detachment) ········ ▧
Band ········ ⊠
Numerals are distances or intervals in paces
3 Wagons
6 Wagons
Line of Battalion Columns (Battalions in Close Column)
Line of Battalions in Column of Company Close Lines (Battalions in Column of Close Lines)
30
20
15

FIG. 137.

The band, arriving from the rear, takes its place in line when the right battalion has halted; it ceases playing when the left battalion has halted. The special units take their places in the line when the battalions in rear of which they are to be posted, have halted.

The rg. c. and those who accompany him take post.

When all parts of the line have been dressed, and officers and all others have reached their posts, the adjutant commands: 1. **Present,** 2. **ARMS**. He then turns about and reports to the rg. c.: **Sir, the regiment is formed**; the rg. c. directs the adjutant: **Take your post, Sir,** and brings the regiment to the order. The adjutant takes his post, passing to the right of the rg. c.

To Dismiss the Regiment.

1716. Being in any formation: **DISMISS YOUR BATTALIONS.** Each bn. c. marches his battalion off and dismisses it.

CHAPTER IV.

SMALL ARMS, NOMENCLATURE, CARE, AND TRAINING.

Sec. I.—U. S. MAGAZINE RIFLE, MODEL OF 1903.

(Ordnance pamphlet No. 69.)

The Assembled Parts and Their Operations.

1717. Most of the operating parts of the rifle may be included under the **bolt mechanism** and **magazine mechanism.**

(1) The **bolt mechanism** consists of the bolt, sleeve, sleeve lock, extractor, extractor collar, cocking piece, safety lock, firing pin, firing-pin sleeve, striker, and main spring.

(2) The bolt moves backward and forward and rotates in the well of the receiver; it carries a cartridge, either from the magazine, or one placed by hand in front of it, into the chamber, and supports its head when fired.

(3) The sleeve unites the parts of the bolt mechanism, and its rotation with the bolt is prevented by the lugs on its sides coming in contact with the receiver.

(4) The hook of the extractor engages in the groove of the cartridge case and retains the head of the latter in the countersink of the bolt until the case is ejected.

(5) The safety lock when turned to the left is inoperative; when turned to the right—**which can only be done when the piece is cocked**—the point of the spindle enters its notch in the bolt and locks the bolt; at the same time its cam forces the cocking piece slightly to the rear, out of contact with the sear, and locks the firing pin.

1718. The **magazine mechanism** includes the floor-plate follower, magazine spring, and cut-off.

(2) **When the cut-off is turned up**, the magazine is "on;" the bolt can be drawn fully to the rear, permitting the top cartridge to rise high enough to be caught by the bolt in its forward movement. As the bolt is closed, this cartridge is pushed forward into the chamber, being held up during its passage by the pressure of those below. The last one in the magazine is held up by the follower, the rib on which directs it into the chamber.

1721. In magazine fire, after the last cartridge has been fired and the bolt drawn fully to the rear, the follower rises and holds the bolt open to show that the magazine is empty.

Precautions.

1722. (1) If it is desired to carry the piece cocked, with a cartridge in the chamber, the bolt mechanism should be secured by turning the **safety-lock** to the **right**. Under no circumstances should the firing-pin be let down by hand on a cartridge in the chamber.

(2) To obtain positive ejection, and to insure the bolt catching the top cartridge in magazine, when loading from the magazine, the bolt must be drawn fully to the rear in opening it.

(3) When the bolt is closed, or slightly forward, the cut-off may be turned up or down as desired. When the bolt is in its rearmost position, to pass from loading **from the magazine to single loading**, it is necessary to force the top cartridge or follower below the reach of the bolt, to push the bolt slightly forward, and to turn the cut-off down, showing "off."

(4) In case of a **misfire** it is unsafe to draw back the bolt immediately, as it may be a case of **hang fire**. In such cases the piece should be cocked by drawing back the cocking piece.

(5) **It is essential for the proper working and preservation of all cams that they be kept lubricated.**

DISMOUNTING AND ASSEMBLING.

1723. The bolt and magazine mechanism can be dismounted without removing the stock. The latter should never be done except for making repairs, and then only by some selected and instructed man.

To Dismount Bolt Mechanism.

1724. (1) Place the cut-off at the center notch; cock the arm and turn the safety lock to a vertical position, raise the bolt handle and draw out the bolt.

(2) Hold bolt in left hand, press sleeve lock in with thumb of right hand to unlock sleeve from bolt and unscrew sleeve by turning to the left.

(3) Hold sleeve between forefinger and thumb of the left hand, draw cocking piece back with middle finger and thumb of right hand, turn safety lock down to the left with the forefinger of the right hand, in order to allow the cocking piece to move forward in sleeve, thus partially relieving the tension of mainspring; with the cocking piece against the breast, draw back the firing-pin sleeve with the forefinger and thumb of right hand and hold it in this position (Fig. 140), while removing the striker with the left hand; remove firing-pin sleeve and mainspring; pull firing pin out of sleeve; turn safety-lock thumbpiece to the right on sleeve and draw it to the rear through the groove made in sleeve for this purpose; turn the extractor to the right, forcing its tongue out of its groove in the front of the bolt, and force the extractor forward and off the bolt.

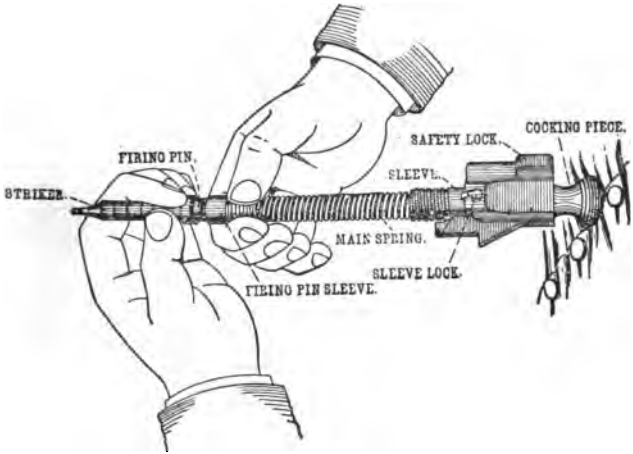


FIG. 140.

To Assemble Bolt Mechanism.

1725. (1) Grasp with the left hand the rear of the bolt, handle up, and turn the extractor collar with the thumb and forefinger of the right hand until its lug is on a line with the safety lug on the bolt; take the extractor in the right hand and insert the lug on the collar in the undercuts in the extractor by pushing the extractor to the rear until its tongue comes in contact with the rim on the face of the bolt (a slight pressure with the left thumb on the top of the rear part of the extractor assists in this operation); turn the extractor to the right until it is over the right lug; take the bolt in the right hand and press the hook of the extractor against the butt plate (Fig. 141) or some rigid object, until the tongue on the extractor enters its groove in the bolt.

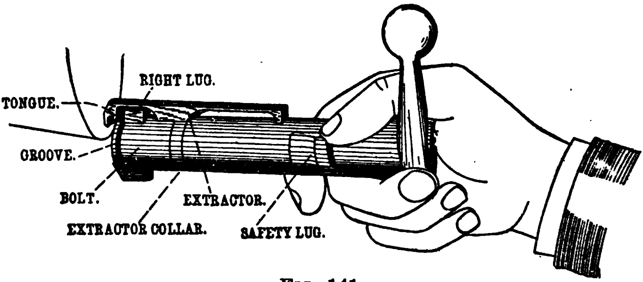


FIG. 141.

(2) Place the safety lock, through the dismounting groove, into position on the sleeve and turn it down to the left so as to permit the firing pin to enter the sleeve as far as possible; place the cocking piece against the breast and put on mainspring, firing-pin sleeve, and striker. (See Fig. 140.) Holding the cocking piece between the thumb and forefinger of the left hand, draw the cocking piece back with thumb and middle finger of the right hand, and turn the safety lock to a vertical position with the forefinger of the right hand; insert the firing pin in the bolt and screw up the sleeve (by turning it to the right) until the sleeve lock enters its notch on the bolt.

(3) See that the cut-off is at the center notch; hold the piece under floor plate in the fingers of the left hand, the thumb extend-

ing over the left side of the receiver; take bolt in right hand with safety lock in a vertical position and safety lug up; press rear end of follower down with left thumb and push bolt into the receiver; lower bolt handle; turn safety lock and cut-off down to the left with right hand.

To Dismount Magazine Mechanism.

1726. (1) With the bullet end of a cartridge press on the floor-plate catch (through the hole in the floor plate), at the same time drawing the bullet to the rear; this releases the floor plate.

(2) Raise the rear end of the first limb of the magazine spring high enough to clear the lug on the floor plate and draw it out of its mortise; proceed in the same manner to remove the follower.

(3) To assemble magazine spring and follower to floor plate, reverse operation of dismounting.

(4) Insert the follower and magazine spring in the magazine, place the tenon on the front end of the floor plate in its recess in the magazine, then place the lug on the rear end of the floor plate in its slot in the guard, and press the rear end of the floor plate forward and inward at the same time, forcing the floor plate into its seat in the guard.

BALLISTICS.

1727. Charge: about 50 grains pyro-cellulose smokeless powder. Bullet: weight, 150 grains, cupro-nickel jacket. Muzzle velocity: 2,700 feet per second. Energy of free recoil: about 15 foot-pounds. Maximum range: about 5,465 yards at 45° elevation. Time of flight: 31.36 seconds.

Range table.

	200 yards.	500 yards.	800 yards.	1,000 yards.	1,500 yards.
Angle of elevation	0° 5′	0° 16′	0° 32′	0° 48′	1° 47′
Time of flight (seconds)	.24	.71	1.31	1.9	3.5
Remaining velocity (feet per second)	2,245	1,668	1,238	1,068	852
Maximum ordinate (feet)	.24	2	7.3	14.5	52.8
Distance from muzzle (yards)	104	271	452	581	885

Penetration table.

Material.	Penetration.			
	50 feet.	100 yards.	500 yards.	1,000 yards.
	Inches.	*Inches.*	*Inches.*	*Inches.*
White-pine butts, made of 1-inch boards, placed 1 inch apart	33.5	46.7	24.3	12.8
Moist sand	8.7	....	13.4	12.5
Dry sand	4.0	....	9.2	7.5
Loam practically free from sand	14.0	....	18.8	18.6
Low steel plate 0.493 inch thick	.45	.26	....	....
Low steel plate 0.384 inch thick	Through.	Through.	....	....
High steel plate 0.385 inch thick	Through.	.24	....	....
Seasoned oak across grain	12.2	33.6	....	....
Brick wall	....	5.0	....	....

THE RIFLE.

1728. The instructor should explain the use of the rear sight and of the principal operating parts, such as the bolt and the magazine mechanisms, especially the safety lock and magazine cut-off, how to remove the bolt and floor plate. He should dismount, clean, and reassemble all parts carried in the bolt and magazine, and require each man to do the same; point out and name the principal parts and cause the men, first, to point out each part as it is named; second, to name each part as it is pointed out.

1729. Precautions.—Unless the bolt is drawn fully back the ejector will fail to work, and in magazine fire it will cause a jam.

When a misfire occurs, press the bolt handle well down, pull the cocking piece to the rear, and try again. Unless the bolt handle is fully down the firing pin does not strike with full force. Almost all misfires are due to this fault.

See that the guard screws are kept tight. Loose guard screws not only prevent good shooting, but also interfere with the proper feeding of cartridges from the magazine, often resulting in a jam.

For practicing the motions of rapid-fire with the rifle unloaded, turn the cut-off down or "off," otherwise the bolt can not be worked back and forth.

1730. The rifle is a weapon of precision, and demands proper care and cleaning. A lack of care soon ruins its accuracy.

After a day's shooting the bore demands special attention, as the residuum from smokeless powder soon corrodes it, and should be removed as soon as practicable.

There are three kinds of fouling:

(1) A black deposit, easily removed by oily rags.

(2) An acid deposit or gas, forced into the texture of the steel, which gradually comes out, and, unless removed, causes rust. Cleaning must be repeated daily for several days.

(3) Metal fouling, caused by particles of the cupro-nickel jacket of the bullet adhering to the bore. This rarely happens with the present ammunition, and its removal is usually not only impracticable in the field, but unless done by an experienced man may cause serious damage to the bore.

1731. To clean the rifle.—(1) Remove the bolt and clean from the breech end. **Never clean from the muzzle.**

(2) Use a cleaning rod and small pieces of cloth about 1½ inches square, then lightly oil the bore by using an oiled rag. The metal and working parts are also cleaned by using dry rags, and then oiling with a slightly oiled rag to prevent rusting and to lubricate working parts.

(3) **No more oil than this light oiling should be used,** because any surplus oil makes the rifle disagreeable to handle, collects dirt and grit, finds its way into and around the bolt mechanism and often flies back into the firer's face and eyes when he fires. The bolt-handle should be dry and entirely free from oil, otherwise in operating the bolt it is difficult to grasp firmly.

(4) If available, a saturated solution of soda and water may be used to clean the bore, thoroughly drying the bore with dry patches before oiling. Or the following mixture may be used: Amyl acetate, 2 parts; acetone, 2 parts; gas engine oil, 1 part. Dissolve the oil in the acetate and add the acetone.

(5) Whatever the method of cleaning, the bore should be cleaned daily for several days.

(6) Cosmoline, machine oil, or any other oil which will not rust the metal is suitable for oiling rifles. Sperm oil is the best for lubricating metallic bearing and contact surfaces, a somewhat heavier oil for the bore. Never use emery or any other material which will scratch the metal.

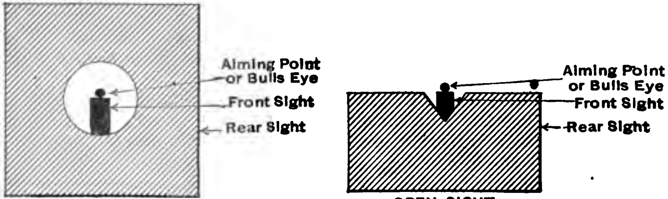
(7) The stock and hand-guard may be coated with raw linseed oil and polished by rubbing with the hand.

Sec. II.—AIMING.

1732. There are several different open-sight notches on the rear sight, but the **peep sight is recommended for all firing.**

In **aiming,** the eye should be held as close as possible to the peep; that is, almost up to the comb of the firing-pin. Then aim at the point it is desired to hit, **keeping the top of the front sight centered in the peep-hole,** as shown in Figure 142. **But when the target** (or **bull's eye) appears ill-defined, or so small as to be masked by the front sight,** aim should be taken **at the lower edge** of such target or bull's eye, since an exact aim is very difficult to maintain when the target is even temporarily obscured, and a wild shot becomes probable.

With any open sight always aim so that the front sight is centered in the rear-sight notch, and just "fills" the notch, *i. e.*, is just even with the top of the rear-sight notch, as shown in Figure 142. Then aim at the point it is desired to hit, or, if the target is small, let it rest on top of the front sight, in the manner explained for the peep sight.



PEEP SIGHT

OPEN SIGHT

FIG. 142.

The battle sight (open sight with sight leaf down) is the only kind of open sight which, because of sudden and unexpected emergency in the field, may have to be used. The battle sight is ranged for 530 yards, and consequently shoots high at all ranges within this distance. Hence with this sight aim about 1 foot below the object, at 200 and 400 yards, and 2 feet below at 300 yards; otherwise the shots will be high.

In firing at living targets, except at very short ranges, **aim should be taken at the bottom of the target.** Thus in aiming at a man at long range, at least half of the body of the man (if standing) should be seen resting on the front sight, or all if he is prone.

In firing against moving targets, it will be necessary to lead the target in order to make a hit, as otherwise the shot will fall behind.

The following table shows the approximate distance necessary to aim ahead of the body of a man or horse moving across the range at various distances and various rates of speed:

Distance (yards).	Man walking.	Man double timing.	Horse walking.	Horse trotting.	Horse running.
100	Front edge.	0.5 ft.	Front edge of body.	Front edge of body.	Front edge of body.
200	0.7 ft.	1.7 ft.	do.	do.	1.3 ft.
300	1.5 ft.	3.0 ft	do.	1.5 ft.	3.8 ft.
400	2.0 ft.	4.4 ft.	do.	3.3 ft.	6.5 ft.
500	3.0 ft.	6.0 ft.	1.0 ft.	5.3 ft.	9.5 ft.
600	4.0 ft.	7.5 ft.	2.0 ft.	7.5 ft.	13.0 ft.

1733. If the sights are bright there will be a glimmer about them which interferes with accurate aiming. They should be a dead black. The sights are blackened by smoking them. A candle is the best thing; a match will do. Oiled rags which have been used to clean rifles make excellent smoke for blackening sights. Blacken both the front and rear sights. The black will not take on greasy metal.

Sight Setting.

1734. The marks opposite the peep indicate where the sight is to be set. The numbers on the sight leaf refer to the marks **below** the numbers; for example, the figure 6 is **above** the 600-yard mark. Changes in elevation of 25, 50, and 75 yards have to be made, and when there are no marks for these settings they have to be estimated, and with great care, for a slight inaccuracy makes a big difference in the point of hit.

1735. The marks on the wind gauge are called points, and changes in windage of quarter points may have to be made.

The bullet is carried in the same direction that the sights are moved; for example, if shots strike above and to the right of the bull's-eye the elevation should be lowered and the windage set to the left. Winds carry the bullet to the right or left with the wind, therefore the windage is set to windward.

1736. The elevation is not always set at exactly the actual range at which the firing takes place. With some rifles the elevation is set above the range, and with others below it, and all rifles are not exactly true for windage.

To teach sight setting it is not sufficient to explain it to the men. They must be practiced in it.

Sec. III.—HOLDING THE RIFLE.

1737. Men should not be permitted to fire left handed. Left-handed men interfere with others on the firing line unless they use their rifles in the normal manner, and the ability to fire right handed can be readily acquired with a little practice.

The Sling.

1738. The sling should be used in all positions. There are no restrictions as to its use. Any efficient method of attaching it to the rifle or person may be used. The method shown here is suitable for all firing. The bight of the loop is even with the comb of the stock. Inexperienced men will claim that it is too short, but it will become easy after practice. Short or fat arms require a longer sling than long or slender arms. If the sling is too long, the rifle will not be firmly held, and a kick from the recoil will be felt.

1738a. Slip the left hand well under the rifle and all the way up to the lower swivel. That part of the sling which bears against the hand should be clear of the metal nibs and of the keepers, because they will cut into the hand and cause pain. The pressure of the hand against the swivel causes a little pain at first, but it soon disappears, and a man should not resist or try to pull his left hand away from it. The rifle rests hard in the flat of the hand and not on the fingers. The left hand and the fingers of the left hand do no work at all.

The sling must be adjusted so that the loop is above the left bicep, and as taut as can be borne without discomfort. Otherwise it can not be fully utilized to steady the rifle.

The Standing Position.

1739. There are various ways of holding the rifle in this position. The left hand is drawn back from the lower band swivel to near the trigger guard. The left arm should rest against the body. The standing position is the most unsteady position and much practice with the rifle unloaded is necessary to cultivate steadiness. Do not be afraid in this position to press the jaw hard against the stock. The head then goes back with the recoil and the face is not hurt. Do not try to meet or resist the recoil. Let the body yield to it.

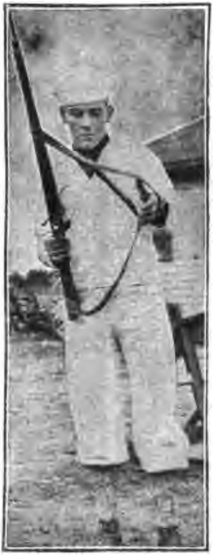


FIG. 143.

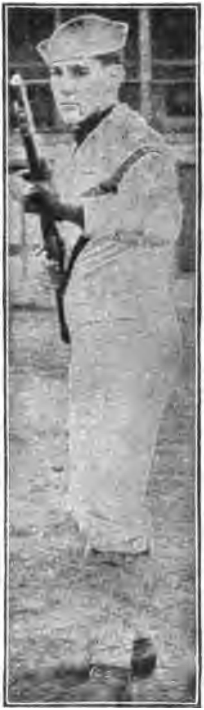


FIG. 144.

Some men may find they can hold the rifle more steady in the standing position, especially at rapid fire, by throwing practically the entire weight of the body on the left leg, keeping the left knee straight, and throwing the left hip out in the direction of the line of fire. The right knee is slightly bent, the right leg merely serving to steady the body. With the body in this position better support is afforded for the left elbow and arm, which should be held close against the body. The right elbow should be held level with the line of sight. Instead of using the loop of the sling around the arm as in all other positions the "grapevine" sling should be used in the standing position. In this the arm is not passed through the loop, but with the sling about the same length from lower band swivel to butt swivel as when using the loop, the left arm is passed through between the gunstock and the sling and one turn of the sling taken around the arm, grasping firmly with the left hand just forward of the trigger guard, at the same time pressing the left arm close against the body. The sling must be kept well up under the armpit, thus holding the sling taut across the chest.

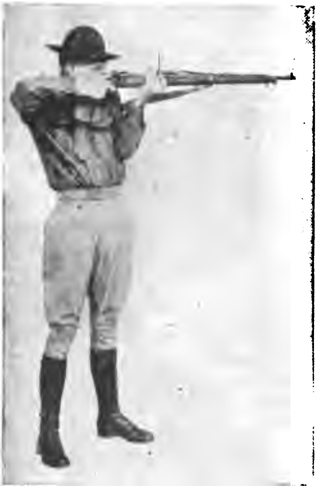


FIG. 145.

On discharge of the piece it will be found that the shock of recoil will be taken up entirely by the sling instead of the shoulder.

This method of using the sling also allows free movement of the right arm and shoulder for operating the bolt in rapid fire so that the piece need not be taken down from the aiming position between shots.

The Squatting Position.

1740. Both feet are flat on the ground and the buttocks clear of the ground. Bend the knees and lower the body, resting both elbows on the knees, the points of the elbows over the knees. This position is comfortable, steady, and quickly taken. (Fig. 146.)

The Kneeling Position.

1741. The right knee points directly to the right, that is, along the firing line. The point of the left elbow is over the knee. There is a flat place under the elbow which fits a flat place on the knee and makes a solid rest. Lean the body well forward. After practice the position ceases to be uncomfortable. (Fig.146.)

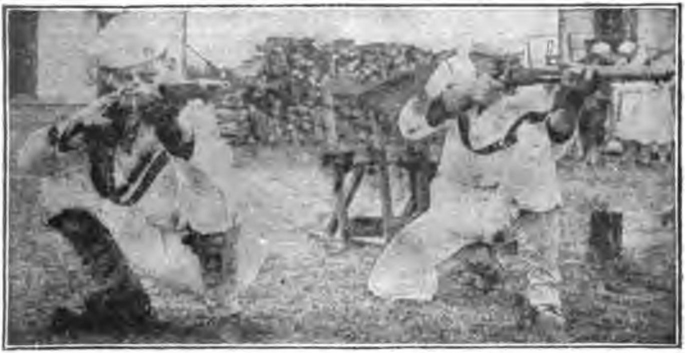


FIG. 146.

The Sitting Position.

1742. The sitting position is useful in outpost service.

There are several varieties of the sitting position; every man must find the one which fits him best. Inexperienced men sometimes find difficulty in adjusting themselves to this position, but with practice it becomes comfortable and steady. The legs must be at rest and the leg muscles not strained when aiming. Lean the body well forward and find a steady rest on the knees for both elbows.

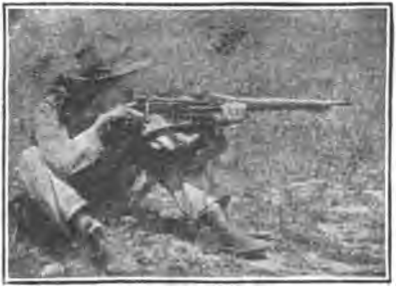


FIG. 147.

The Prone Position.

1743. Lie flat down at an angle of about 45° to the firing line, spread the legs wide apart, and turn the heels inboard. Flatten the middle part close to the ground. Place the point of the left elbow to the front, and well to the right, then raise the right shoulder and placing the right hand on the butt plate put the butt of the rifle against the shoulder, and flatten out again. Put the cheek or jaw hard against the small of the stock, the thumb of the right hand along and not across the stock, and the right eye up to the firing pin, as close to the peep sight as possible. Let the right elbow spread out, and drawing the body back, get the chest and the whole body as flat on the ground as possible. The left elbow must be directly under the rifle. The right elbow is moved **out** to raise and **in** to lower the muzzle. Now the rifle can not kick. The only recoil will be of the whole body, which will not be felt.

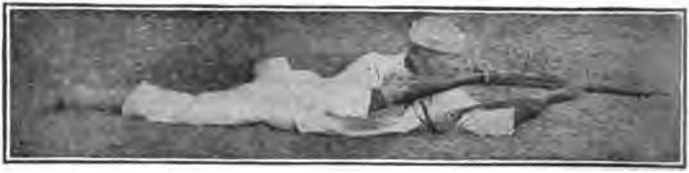


FIG. 148.

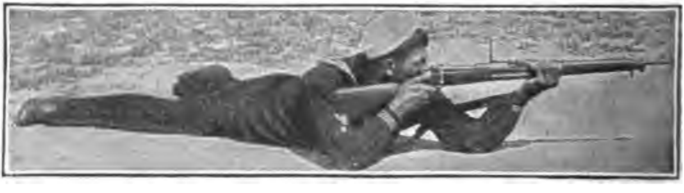


FIG. 149.

Artificial Rests.

1744. The use of artificial rests adds steadiness in aiming. In the standing position, a tree or post may be used. Shoot from the right of the post, resting either the rifle or arm against the post. In firing from behind a parapet, any of the positions may be used, depending on the height of parapet.

Sec. IV.—GENERAL PRINCIPLES FOR FIRING IN ALL POSITIONS.

1745. **Press the check hard against the stock.**

Thumb is along, and not across, the stock.

Never cant the rifle. Keep it plumb. If it is canted the least bit the bullet will strike in the direction of the cant.

Breathe out naturally and then do not breathe while aiming.

If you aim too long you will become unsteady and your eyesight will get bad. Take the rifle from the shoulder, rest, and aim again.

Squeeze the trigger. There is a little slack in the trigger. When aiming take this up with the finger so that when you wish to fire you have only to increase the pressure of the finger.

Before firing, cock the rifle, and with the rifle unloaded squeeze the trigger. This will steady you down and get you better acquainted with your trigger pull.

Do not yank or pull the trigger; squeeze gently the whole small of the stock with the right hand. Let the trigger off as easy as you can, and keep up the aiming while the gun is being discharged, then you can tell where you were aiming when the bullet left the rifle.

Call the shot. As soon as you have squeezed the trigger, and before the target is marked, "call the shot," that is, call out loud where you were aiming when the trigger was squeezed, and when the bullet left the rifle.

A man who intends to call the shot will not shut his eyes when he squeezes the trigger; he will not quit aiming while he is squeezing the trigger. He will not flinch. Calling the shot is the best cure for flinching. Make up your mind to continue aiming while the piece is being fired. Calling the shot will help you do all these things.

1746. **In rapid fire keep the butt to the shoulder.** To load, lower the muzzle to the right and work the bolt, being careful to draw it fully back, so it will eject the empty shell and not cause a jam. It will become easy after pratice.

In reloading prone with the rifle resting on a parapet and without removing the butt from the shoulder raise the right elbow well above the ground. It requires practice to do this conveniently.

Notes on Winds.

1747. **The direction of winds** is expressed by use of the word "o'clock." A wind coming directly from the target is a 12 o'clock wind. A wind blowing directly toward the target is a 6 o'clock wind. Both 12 and 6 o'clock winds, also winds from about 11, 1, 5, and 7 o'clock are called **fish-tail winds.** Winds from the firer's right as he faces the target are 3 o'clock winds, and from the left 9 o'clock winds. Both 3 and 9 o'clock winds and also 2, 4, 8, and 10 o'clock winds are called **cross winds.**

1748. At the shorter ranges, winds do not affect the bullet much. The direction of winds is never steady, and at the longer ranges the slightest change in direction of fish-tail winds causes great effect in lateral deviation of the bullet. Considerable change in direction of cross winds causes very little effect in lateral deviation of the bullet, and even if they are strong winds they are favorable conditions for shooting.

The Windage Rule.

(How to calculate the windage required.)

1749. **Range, in hundreds of yards, times velocity of wind, in miles per hour, divided by 10 equals number of quarter points of windage required for 3 or 9 o'clock winds. Winds 1 hour away from 3 or 9 o'clock—that is, 2, 4, 8, 10 o'clock winds—require only slightly less windage; winds 1 hour away from the 12 or 6 o'clock line—that is, 11, 1, 5, and 7 o'clock winds—require about half as much windage as the 3 or 9 o'clock winds.**

If trees or other objects obstruct the wind the effect of the wind on the bullet is less than if the wind is unobstructed, and this must be allowed for in estimating windage.

The Quarter Point Rule for Changing Windage.

(How to change windage in slow fire after hitting the target.)

1750. Changing the windage ¼ point moves the bullet 1 inch for every 100 yards of range. For example:

¼ point at 200 yards moves the bullet 2 inches on the target.
¼ point at 300 yards moves the bullet 3 inches on the target.
¼ point at 400 yards moves the bullet 4 inches on the target.
¼ point at 500 yards moves the bullet 5 inches on the target.
¼ point at 1000 yards moves the bullet 10 inches on the target.

The Square Rule for Changing Elevation.

(How to change elevation after hitting the target.)

1751. Changing the elevation 100 yards at any range gives change on the target equal to the number of inches in the square of the range.

Example: At 200 yards changing the elevation 100 yards gives 4 inches change on the target; at 300 yards, 9 inches; 500 yards, 25 inches; 600 yards, 36 inches; 1000 yards, 100 inches.

This rule is not exact, but is close enough for all purposes.

1752. Do not make changes in windage or elevation boldly. Make a little less change than what the rules would call for. In practice, changes seem to carry the bullet more than expected. Change cautiously. In case of doubt, favor the smaller change, and unless quite sure of the hold or pull, or unless changes in conditions suggest it, do not change for one shot a little off.

Always aim the same way and control the point of hit by changing elevation and windage.

Finding the Target.

1753. If the target is not hit by the first shot the trouble is probably in elevation, because any error in estimating the windage should not be sufficient to carry the shot off the target. To find the target, make changes in elevation of 50 yards at a time. Often misses are the result of neglecting to set the sight or of the sight slipping down. First examine the sight and see that the windage has been set on the correct side, and then if you have made no mistakes you should begin by coming down at long range 50 yards, then if you miss again come up 50 yards from the original elevation, and so on until you find the target.

Weather Conditions.

1754. There are two conditions which considerably affect elevations at long range; they are light and what is called by riflemen mirage. Their effect is not noticeable at short ranges, and is small at mid-ranges (500 and 600 yards), but is considerable at long ranges (800 and 1,000 yards). The effect on elevations of head and tail winds is noticeable at 1,000 yards and strong winds require an allowance of not over 25 yards at 1,000 yards. Higher elevation is required for head winds and lower elevation for tail winds.

1755. Light.—A change in conditions from bright light (sunshine) to dull light (cloudy) requires changes in both elevation and windage.

If you are shooting in a dull light and the sun comes out, your shots will then strike low, and if the sun is to the right your shots will also strike to the left, or, if the sun is to the left, your shots will also strike to the right.

The effect of light must therefore be compensated for, and the rule is to move your sight into the sun both for elevation and windage. In other words, if shooting in a dull light and the sun comes out raise your elevation and move the windage to the right if the sun is to the right or to the left if the sun is to the left.

The amount of change to make for sunlight has been found by practical experience to be from ¼ to ½ point of windage and about 25 yards in elevation.

A good plan for mid and long range slow fire, when shooting in changing lights, is to wait as much as possible and try to fire your shots under the same light conditions.

1756. Mirage.—What is called **mirage** by riflemen is not true mirage, but is the heat waves often noticed with the naked eye, but more clearly seen with the telescope. It is really the air traveling on the range. It is the best guide for windage, because as seen through the telescope directed at the target it is the actual air through which the bullet travels, while flags may show currents of air moving in other directions. When the mirage and flags do not agree, which is often the case on the range, the mirage is the true guide.

The ability to use the mirage skillfully in shooting is what distinguishes the real long-range rifleman from the novice. Strong winds dispel mirage. The information obtained from the mirage is more valuable when the wind is light, and especially when it is fish-tailing; that is, shifting from one side to the other.

1757. Heavy mirage calls for higher elevation.—A heavy mirage causes a wavy appearance of the target, making the bull's-eye appear to be drawn out and down, and consequently higher elevation is required.

When the wind is fish-tailing the mirage changes direction; that is, sometimes moves to the right and sometimes to the left. When there is no movement to the right or left, the wind is either still for the moment or the wind is carrying the mirage directly toward or from the target. The mirage then appears to rise, and is said to be "boiling." Try to avoid shooting in a "boil," for this is when the elevations are more disturbed and you are liable to get a miss (below the target). This accounts for some misses which inexperienced shooters are apt to call "unaccountables." The mirage "boils" just as it changes direction from right to left or from left to right. Wait for the mirage to take a movement to the right or left; it never "boils" long. A light mirage which is not in a "boil" does not appreciably affect elevation.

Sec. V.—THE PISTOL.

(Ordnance pamphlet No. 68.)

Mechanism of the Pistol.

1758. To thoroughly familiarize men with the mechanism of the pistol they should be required to dismount and assemble its parts under an instructor in the manner prescribed for the rifle, article 1728. This may be done without tools.

To dismount: Remove the magazine by pressing the magazine catch.

Press the plug inward and turn the barrel bushing to the right until the plug and the end of the recoil spring protrude from their seat, releasing the tension of the spring. In carrying out this operation, the finger should be held over the plug to prevent it from jumping away; then remove the plug.

Draw the slide rearward until the smaller rear recess in its lower left edge stands above the projection on the thumb piece of the slide stop; press gently against the end of the pin of the slide stop, which protrudes from the right side of the receiver above the trigger guard and remove the slide stop. This releases the link, allowing the barrel, with link and slide, to be drawn forward together from the receiver, carrying with them the barrel bushing, recoil spring, and recoil-spring guide. Remove these parts from the slide by with-

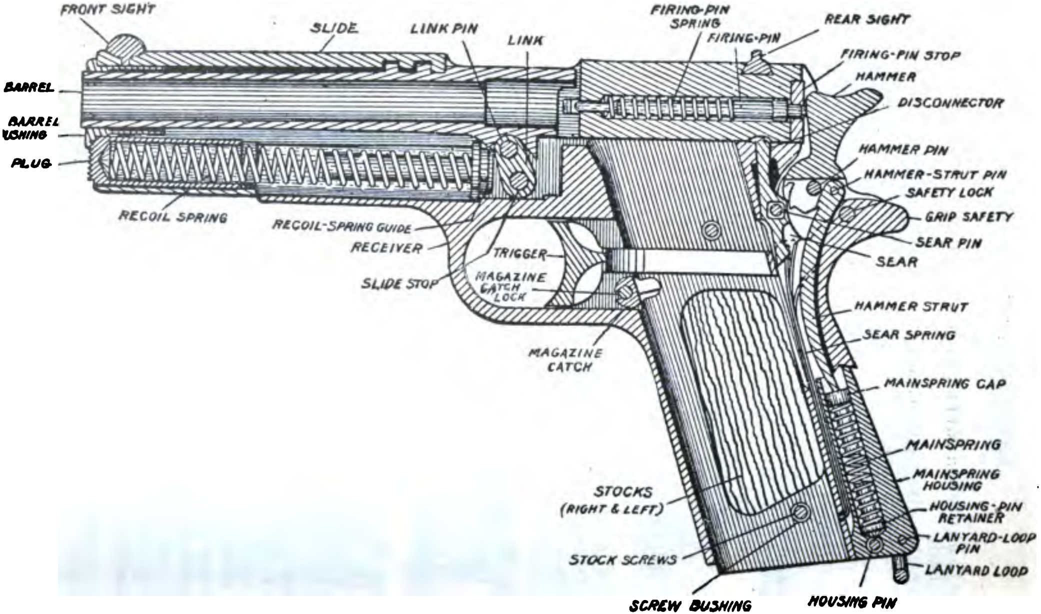

FRONT SIGHT
SLIDE
LINK PIN
LINK
FIRING-PIN SPRING
FIRING-PIN
REAR SIGHT
FIRING-PIN STOP
HAMMER
DISCONNECTOR
BARREL
BARREL USHING
PLUG
HAMMER PIN
HAMMER-STRUT PIN
SAFETY LOCK
GRIP SAFETY
SEAR PIN
SEAR
RECOIL SPRING
RECOIL-SPRING GUIDE
RECEIVER
TRIGGER
SLIDE STOP
MAGAZINE CATCH LOCK
MAGAZINE CATCH
HAMMER STRUT
SEAR SPRING
MAINSPRING CAP
MAINSPRING
MAINSPRING HOUSING
STOCKS (RIGHT & LEFT)
HOUSING-PIN RETAINER
LANYARD-LOOP PIN
STOCK SCREWS
LANYARD LOOP
SCREW BUSHING
HOUSING PIN

FIG. 150.

drawing the recoil-spring guide from the rear of the recoil spring; then draw the recoil spring forward from the slide.

Turn the barrel bushing to the left until it may be drawn forward from the slide; this releases the barrel which, with the link, may also be drawn forward from the slide.

Partial dismounting of the pistol, as indicated in the preceding paragraphs, is all that is required ordinarily for proper care and cleaning. Only experienced men should be permitted to dismount other parts of the pistol.

To assemble: Assemble the parts in the reverse order from that given for dismounting.

Care and Handling.

1759. When the slide is in its forward position and the hammer is full cocked, push the safety-lock up to lock the hammer.

1760. The grip safety at all times automatically locks the trigger unless the grip safety is pressed in by firmly grasping the handle as in the firing position.

When the slide is drawn fully back to its rear position, if the magazine is empty the slide stop automatically locks the slide in its open position; if the magazine is not empty, and there is no jam, the slide when released will spring to its forward position unless it is locked by pressing the slide stop up into the recess on the slide.

When the pistol is fired and the slide remains open, it indicates either that the magazine is empty or that there is a jam.

To relieve a jam it is often necessary to remove the magazine.

To remove the magazine, press the magazine catch.

1761. To load, charge the magazine with any number of cartridges from one to seven (with five for a string in the Navy courses); insert the magazine into the hollow of the handle with a quick continuous movement until the click of the magazine catch is heard; then draw the slide fully back and release it, thus cocking the pistol and bringing the first cartridge into the chamber. The pistol is now ready for firing.

1762. With the magazine empty, the pistol can be used as a single loader by drawing back the slide, inserting a cartridge in the chamber, and pressing down the slide stop to release the slide.

1763. After the pistol is single loaded (and locked as a safety precaution), a filled magazine may be inserted; the pistol then carries eight cartridges ready for use.

It is dangerous, however, to carry the pistol thus loaded, and except in emergencies, the pistol should be carried with the chamber empty. When cartridges are in the magazine, to cock, load the chamber, and fully prepare the pistol for use it is only necessary to draw the slide fully to the rear and release it.

1764. Pressure must be entirely relieved from the trigger after each shot in order that the trigger may reengage the sear.

1765. To inspect a pistol to see that it is unloaded, or to unload it, draw the slide to the rear and release it as often as is necessary until it automatically remains in the open position. If loaded, each time the slide is drawn to the rear a cartridge will be ejected.

The Revolver.

1766. With the revolver, to load, unload, or inspect it to see whether it is loaded hold the revolver in the left hand, cylinder in the palm of the hand, muzzle pointing to the front or in a safe direction; unlatch and open the cylinder. In closing the cylinder press it home smartly until it clicks, and then verify latching by pressing against the right side of the cylinder. The revolver is injured and often disabled by attempting to operate the trigger or hammer when the cylinder is not fully home and latched. Do not attempt to open the cylinder when the hammer is cocked. With the revolver always, even in rapid fire, use the single action; that is, cock it before firing each shot. The trigger pull of the double action is so heavy that it is impossible to keep the aim in using it. It can be easily cocked by removing the finger from the trigger, raising the muzzle to the right, moving the right hand up on the stock, and placing the thumb across the hammer. This should be practiced until it can be done readily.

When the revolver is to be carried loaded, the chamber under the hammer should always be left empty; otherwise a premature discharge may be caused by a blow on the hammer.

Sec. VI.—NOTES ON PISTOL SHOOTING.

1767. When a pistol is first taken in hand it should be examined to make sure that it is not loaded.

1768. Both the front sight and the rear sighting groove should be blackened. When the pistol is aimed the front sight should be seen through the middle of the rear sighting groove and the top of the front sight should be flush with the top of the groove. The part of the target to be aimed at must be determined by practice. With most pistols at 25 yards the aim is usually taken at the bottom edge or in the bottom part of the bull's-eye, and at 50 yards in the center or in the upper part of the bull's-eye.

1769. **Grasp the stock** of the pistol as high up as you can so that the barrel, hand, and arm are as nearly as possible in one straight line. The thumb should be extended along the upper part of the frame. The second joint of the forefinger should be on the trigger.

1770. **Start with a light grip and gradually squeeze** with the whole hand, the trigger finger squeezing gradually back as the grip is tightened, and continue squeezing without a jerk until the pistol fires. Decide to call the hold and to keep the right eye open.

1771. **If the hits are bunched to one side** they can be moved to the right by increasing the pressure of the thumb against the left side of the pistol or to the left by decreasing the pressure.

1772. **Snapping**—that is, aiming and squeezing the trigger with the pistol not loaded—is most valuable practice. No man should load and fire until he has snapped several times to get acquainted with the trigger pull of the pistol. Expert pistol shots do a great deal of snapping instead of a great deal of firing. Steady holding can be acquired only by much snapping practice.

1773. **Positions.**—In the prone position the right elbow has excellent support on the ground. In the kneeling position the firer may kneel on either knee. Kneeling on the left knee affords an excellent rest on the right knee for the elbow. In the squatting position both elbows rest on the knees. In the standing position face the target squarely, or nearly so. Stand upright, not craning the head forward, and extend the arm to its full stretch.

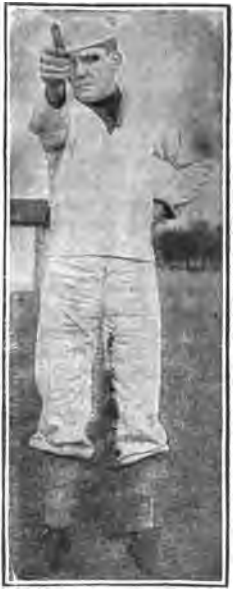


FIG. 151.

Sec. VII.—ESTIMATING DISTANCE.

1774. The following information regarding training in estimating distance, and the method of conducting the efficiency test, with the percentage required for qualification in marksmanship in the U. S. Army, is here quoted in order that similar training, when practicable, be carried out in the naval service during shore drills or field exercises and maneuvers.

1775. Importance.—Ability to estimate distance correctly is an important element in the education of the rifleman.

During the estimating distance drills advantage should be taken of every opportunity to train the rifleman in observing his surroundings from positions and when on the march. He should be practiced in pointing out and naming different features of the ground; in discovering and describing different objects; in counting different objects or beings. Especially should petty officers be trained in describing the location, with reference to other objects, of objects difficult to see and in imparting information of this kind quickly and accurately.

1776. Distances can be estimated by the eye or by sound; they can be determined by range-finding instruments, by trial shots or volleys, or from maps.

1777. Estimation of distance by eye.—To estimate distance by the eye with accuracy, it is necessary to be familiar with the appearance, as to length, of a unit of measure which can be compared mentally with the distance which is to be estimated. The most convenient unit of length is 100 yards. To impress upon each man the extent of a stretch of 100 yards, two posts 100 yards apart, with short stakes between to mark each 25 yards, should be placed near the barracks, or on the drill ground, and the man required to pace off the marked distance several times, counting his steps. He will thus learn how many of his steps make 100 yards and will become familiar with the appearance of the whole distance and of its fractional parts.

Next a distance of more than 100 yards will be shown him and he will be required to compare this distance with the 100-yard unit and to estimate it. Having made this estimate, he will be required to verify its accuracy by pacing the distance.

The rifleman should be taught that, in judging the distance from the enemy, his estimate may be corrected by a careful observation of the clearness with which details of dress, the movements of limbs, or of the files in a line may be seen. In order to derive the benefit of this method, each man will be required to observe closely all the details noted above in single men or squads of men posted at varying distances, which will be measured and announced.

1778. Methods of estimating long distances by the eye.—The following methods are found useful:

(1) Decide that the object can not be more than a certain distance away nor less than a certain distance; keep the estimates within the closest possible limits and take the mean of the two as a range.

(2) Select a point which appears to be the middle point of the whole distance; estimate the half distance and double it, or similarly divide the distance into a certain number of lengths which are familiar.

(3) Estimate the distance along a parallel line, as a road on one side, having on it well-defined objects.

(4) Take the mean of several estimates made by different persons. This method is not applicable to instruction.

1779. Appearance of objects; how modified by varying conditions of light; difference of level, etc.—During instruction the men should be taught the effect of varying conditions of light and terrain upon the apparent distance of an object.

Objects seem nearer:

(1) When the object is in a bright light.

(2) When the color of the object contrasts sharply with the color of the background.

(3) When looking over water, snow, or a uniform surface like a wheat field.

(4) When looking from a height downward.

(5) In the clear atmosphere of high altitudes.

Objects seem more distant:

(1) When looking over a depression in the ground.

(2) When there is a poor light or a fog.

(3) When only a small part of the object can be seen.

(4) When looking from low ground upward toward higher ground.

1780. Estimating distance by sound.—Sound travels at the rate of about 1,100 feet, or 366 yards, per second. If a gun is fired at a distance, a certain time elapses before the sound is heard. If the number of seconds or parts of seconds between the flash and the report be carefully taken and multiplied by 366, the product will be approximately the distance in yards to the gun. This method will be of doubtful use on the battle field, owing to the difficulty of distinguishing the sound of the gun whose flash is seen from that of any other. It will probably be useful in determining the range to a hostile battery when it first opens fire.

1781. Determination of distance by trial shots or volleys.—If the ground is so dry and dusty that the fall of the bullets is visible through a glass or with the naked eye, a method of determining the distance is afforded by using a number of trial shots or volleys.

The method of using trial volleys is as follows:

The sights are raised for the estimated range and one volley is fired. If this appears to hit but little short of the mark an increase of elevation of 100 yards will be used for the next volley. When the object is enclosed between two volleys, a mean of the elevations will be adopted as the correct range.

The range may be obtained from near-by battery or machine gun. This is the best method where available.

1782. Estimating distance test.[1]—When instruction shall, in the opinion of the company commander, have progressed to such an extent as to enable the men to judge distances with the eye with fair accuracy, they will be tested for proficiency.

As the danger space is continuous for a man kneeling within a range of 547 yards (battle-sight range), and as individual fire and the fire of small squads will ordinarily be limited to 1,200 yards, men will be tested for proficiency at distances between these two ranges.

The rules governing this test are as follows:

(1) The test will be supervised by an officer.

(2) Each man will be tested separately.

(3) The ground shall be other than that over which he has fired for target practice, or over which he has previously estimated distances.

(4) The use of any device to mark the limits within which distances are tested (570 and 1,200 yards), at the time the test is given, so that this device can be seen from the estimating point, is prohibited.

(5) The objects will be natural objects, men standing, kneeling, or prone.

(6) Five or more natural objects will be selected, or single men or groups of men stationed within the ranges indicated above. The distances of the objectives will not be measured until all who are to estimate on them have made their estimates.

The men to be tested are conducted to a point near that from which the estimates are to be made, and remain facing away from the objectives or hidden therefrom by some feature of the ground. They are not permitted to know what objects are to be used in the test until they are called up to the estimating point.

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[1] Qualification in estimating distance is not required in connection with the Navy Small-Arms Firing courses and does not affect the qualification attained.

The officer conducting the test calls up one man at a time, points out to him an object and causes him to estimate the distance thereto. This is continued until the man's estimates on five objectives have been obtained. When the test for the day is completed by any man, he will not be allowed to join the squad awaiting test. After all the men have made estimates of distances to a given series of objectives, ranges thereto will be measured.

(7) Proficiency for the expert rifleman and for the sharpshooter shall consist in making in five consecutive estimates an average degree of accuracy of 90 per cent.

Similarly for proficiency, marksmen, first-class men, and second-class men are required to make in five consecutive estimates an average degree of accuracy of 85 per cent.

CHAPTER V.

ARTILLERY.

Sec. I.—GENERAL PRINCIPLES, ORGANIZATION, ETC.

General Principles.

1783. Field artillery in the U. S. Naval Service is normally drawn by man power; and the personnel, whether for the service of the piece or for its transport, have many duties identical with those of infantry, and must, in order to carry out efficiently all their duties, be drilled also as infantry.

1784. While the artillery organization is designed to permit the ready conversion of artillery units into the corresponding infantry units, and vice versa, artillery should be permanently assigned; otherwise the personnel will be unable to acquire the necessary technical skill for the efficient handling of the guns under the varying conditions of service. This is especially true of guns fitted with panoramic sights and provided with fire-control instruments, in the use of which theoretical knowledge must be supplemented by practice, if the best results are to be attained. (See Art. 101.)

Organization and Administration.

1785. The field artillery of a naval force is composed of platoons, companies, battalions, and regiments.

The **platoon** consists of the piece, limber, equipment, gun squad, and dragmen.

The **company** consists of from 2 to 4 platoons; it contains the number of platoons assigned to the organization's normal infantry company, and constitutes the artillery force of a vessel of the first class.

In general, the battalion is composed of the artillery companies of a division of the fleet, or of several vessels, as ordered by the senior officer present. The regiment is correspondingly composed of the artillery battalions of two or more divisions.

1786. When the drag is manned, the platoon is the smallest unit; but when cleared for action the platoon divides into the gun fully manned, and the dragmen. Artillery, when cleared for action, is said to be **in battery**. The guns of an artillery company together form the **firing battery**, and the combined dragmen form the **supports**. The term **battery**, however, is not restricted to the guns of a single company, but is used to designate any number of pieces, grouped together for the time being, under a single fire-control officer, for firing against a given objective. It is not a tactical unit, and not (under ordinary conditions) a permanent subdivision. It refers primarily to the guns and not to the men; the latter retain their company and battalion organization.

1787. All units are numbered sequentially within the next higher unit, e. g., second battalion, third company, second platoon.

For purposes of drill and maneuver, units will be designated by their temporary relative position in line or column, thus:

The right battery, left battalion;

The leading company, center battalion.

The permanent designation of units does not change as their relative order in line or column is changed, with the following exception:

After the pieces of a company (or battery) are unlimbered and established in line, they are designated from right to left as first piece, second piece, etc., or No. 1, No. 2, etc.

1788. The number of men required for the gun crew, whatever the type of gun, is the same; and in general they perform the same duties in the service of the piece.

The fire-control detail is a company, not a platoon detail. The number of men required varies according to the equipment provided. The men of this detail (except the musicians) normally form part of the dragmen detachment when the drag is manned, but may be separately organized if desirable.

The strength of the dragmen detachment, normally of three squads, will vary according to requirements. More men are required naturally for the heavier guns or where there is to be actual service in rough country. Whenever practicable for service ashore, horse, mule, or other transportation facilities will always be utilized; but even under these conditions the platoons will be maintained at normal strength.

1789. Where special equipment is supplied, as for example, a caisson and limber, or motor or animal transportation, such modifications of the drill laid down herein, as may be necessary, are permitted. Unnecessary changes should be avoided.

Duties of Officers.

1790. The company commander commands the company in whatever formation the company may be, and normally controls the fire of his guns when in action.

Platoon commanders command their platoons when the drag is manned.

When prepared for action, the senior pt. c. exercises immediate supervision over the firing battery, and commands in case the c. c. is too distant to give his orders by word of mouth. The pt. c. next in rank commands the combined supports. Other pt. cs., if any, may be assigned as reconnaissance officer, assistant to the senior pt. c., or in charge of the supply trains. The company c. p. o. assists the c.c.

1791. Officers commanding battalions and larger units have duties corresponding to those of similar units of infantry.

When the guns of more than one company are combined for purposes of fire control, the senior c. c. of the guns so grouped becomes fire control officer of the combined battery.

1792. When the combined supports are called into action away from the guns, the bn. c. will designate an officer to take charge. Under the conditions of the preceding article, this will normally be the c. c. not engaged in control of fire. Such duty for the supports is to be regarded as exceptional.

Definitions.

1793. The provisions of Infantry Drill Regulations apply except where obviously inappropriate. The following additional definitions are considered essential:

Salvo: A single discharge from each of the guns of a battery, or other unit, fired in regular order from one flank to the other, with intervals of about two seconds.

Volley: The rapid discharge of a certain indicated number of rounds by each gun of a battery, or other unit, each gun firing without regard to the others.

The foregoing definitions differ from their commonly accepted usage in the Naval Service. The differences should be carefully noted, as the definitions are standard for all works on field or land artillery.

Equipment and Characteristics of Guns.

1794. (1) There are at present four different types of 3-inch landing and field guns used by the Navy and Marine Corps. They are the Mark I, mod. 1, field gun of Gun Factory design, issued to gunboats and cruisers; the Mark IV landing gun, known as the Bethlehem gun, issued to battleships; the Mark VII landing gun, known as the Ehrhardt gun, issued to the Marine Corps; and the Mark XI landing gun, built at Bethlehem, for issue to battleships to replace the Mark IV gun.

All of these guns are provided with navy limbers, which serve the double purpose of supporting the trail of piece and carrying ammunition. The Mark VII is sometimes also provided with army caisson and limber.

(2) The distinction between a landing gun and a field gun in our service is primarily one of muzzle velocity, a field gun being of 1,150 foot-seconds and a landing gun of 1,650 foot-seconds. The ammunition is not interchangeable.

	Mark I., Mod. 1.	Mark IV.	Mark VII.	Mark XI.
Muzzle velocity	1,150	1,650	1,650	1,650
Weight of gun alone	396	576	539	575
Weight of gun and carriage.	1,380	1,717	2,249	2,300
Weight of limber	740	620	1,750	550
Number and type ammunition box carried on piece, rounds per box, how stowed in box.	4R-8V	2R-12V	None	None
Same for limber	6R-8V	2R-12H 2F-6H	9R-8V	2F-20H
Weight of 1 round ammunition.	15	16.5	16.5	16.5
Weight of gun and carriage, with full ammunition.	1,860	2,113	2,249	2,300
Same for limber	1,460	1,214	2,938	1,200
Remarks	Open sight, no sliding leaf, 3° train, 10° elevation.	Peep sights, defl. scale in mils, 10° train, 15° elevation.	Panor. sights, gun shield, 2½° train, 18° elevation.	Panor. sights, gun shield, split trail, 45° train, 50° elevation.

F=Fixed.
R=Removable.
H=Stowed horizontally in its box.
V=Stowed vertically in its box.

(3) The general characteristics of the different types are as shown in the table. Further details are given under preparing for action and service of the piece, articles 1811, 1812, and 1852 et sq.

General Rules.

1795. (1) The general rules of Infantry Drill Regulations apply except where obviously inappropriate.

(2) When not engaged in the service of the piece, or as dragmen, the personnel is handled in the same manner as any similar body of infantry.

(3) When the drags are manned, artillery units are maneuvered exactly like corresponding infantry units, and by the same commands, except that the platoon is the smallest unit, and except where otherwise provided in these regulations or obviously impracticable.

(4) The **front**, *when the drag is manned*, is in the direction in which the *trail* points; *when in battery*, it is the direction in which the *muzzle* points. The terms right, left, and rear are with reference to the front so defined. *Front* is also used to designate the direction of the enemy.

(5) The **dress**, when the drag is manned, is on the drag leaders; when in battery, it is on the axles of the pieces.

(6) In simultaneous or successive movements, alignments are preserved according to the rules for infantry.

Ordnance Pamphlets.

The following ordnance pamphlets relate to artillery:

146. Handbook of three-inch field guns and landing guns and ammunition.

147A. Ammunition boxes for three-inch limber, Mark IV.

148A. Ammunition boxes for three-inch field carriage, Mark II and Mark II, Mod. I and limber, Mark II, Mod. I.

149A. Ammunition boxes for three-inch field carriage, Mark IV, and limber, Mark III.

133. Three-inch range table, I.V. 1,650 f. s. to 6,000 yards, shrapnel.

135. Three-inch breech mechanism, Mark I field guns, Fletcher type.

136. Three-inch range table, I. V. 1,150 f. s. 4,500 yards, common shell.

137. Three-inch range table, I.V. 1,150 f. s. to 5,000 yards, shrapnel.

Sec. II.—SCHOOL OF THE PLATOON.

1796. An artillery platoon consists normally of a pt. c., two 1 p. os., a gun squad and three squads of dragmen; but the number of dragmen may be increased or decreased, depending on circumstances. The members of the gun squad are assigned, for convenience of designation, numbers from 1 to 8, the front rank men being 1-4 respectively, and the rear rank men 5-8, respectively; No. 4 is habitually squad leader and gun pointer.

1797. The platoon has three formations, namely: **Platoon to the front, at the drag, and in battery.**

Formation Platoon to the Front.

1798. The formation is that of a platoon of infantry, gun squad on the left (see Fig. 152). Pieces are at the order unless otherwise directed.

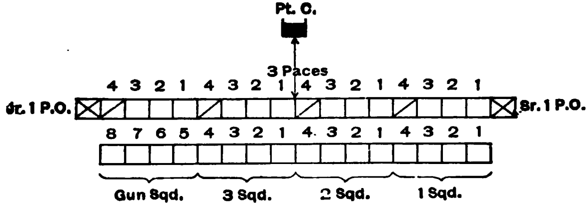

FIG. 152.

Formation at the Drag.

1799. (1) The drag consists of a span and cross bar, 3½ feet long, with two drag ropes. Each drag rope is fitted with 4 or 6 toggles, 5 feet apart, and may be lengthened by fitting extension pieces, with toggles, or shortened by stopping back one or two toggles. The span and each drag rope are fitted with snap hooks, which hook into appropriate thimbles, so that if desired either drag rope may be used alone, without the span, or both combined to make a single drag of double lengths.

(2) The double drag is the normal formation. The front rank mans the left drag rope, rear rank the right drag rope; even numbers on the left of the drag, odd numbers on the right; each squad intact.

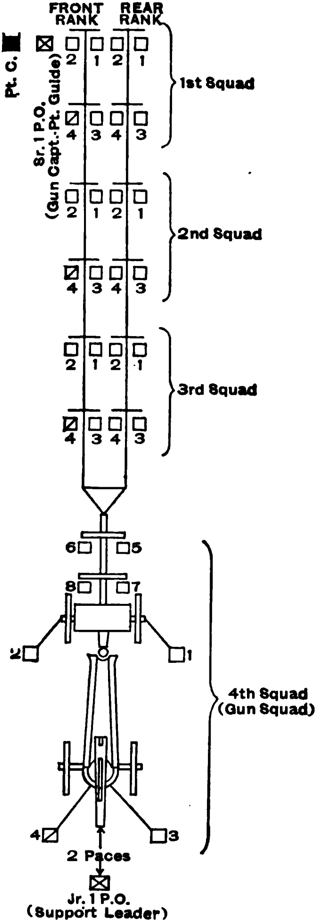

Fig. 153.

Stations of individuals are shown in Fig. 153. The senior 1 p. o. is abreast of the drag leaders, the junior 1 p. o. is 2 paces in rear of the piece. The pt. c. is on the left of the platoon guide.

(3) Pieces for all p. os. and men are carried at the diagonal sling (Art. 1802); but dragmen may be directed to carry the piece in the free hand, or at the right or left shoulder, according as they are on the right or left of the drag.

(4) **Without limber**: *Modifications:* Nos. 1 and 2 man the guide ropes at the trail of the piece; 5, 6, 7, 8 man the rear toggles at the drag, in order from right to left.

The Formation in Battery.

1800. This formation is described later under "To Prepare for Action" (Arts. 1811 and 1812).

To Form the Platoon.

1801. The command is given **Fall in at the drag** (or **Fall in, platoon to the front**).

(1) If formed *at the drag*, the men take stations, sling arms, and pick up the drag without command. The muster is made by the senior 1 p. o., or by squads, as directed. The pt. c. receives the report from the senior 1 p. o. and takes command.

(2) If formed *to the front*, the procedure is the same as for an infantry platoon.

To Sling Arms.

1802. The rifle being in any position, 1. **Sling**, 2. **ARMS**. (1) At the second command, prepare the strap; raise the piece with the right hand, insert the thumb of the left hand through the strap, and shift the right hand to the small of the stock; then, raising the rifle, insert the head and right arm through the strap, and allow the piece to hang diagonally across the back, muzzle up and to the left, strap over the left shoulder.

(2) When slung in this manner, men on the left of the dragrope steady the piece with the left hand, by means of the strap; men on the right of the dragrope, with the right hand, at the butt.

(3) When packs are worn, the rifle may be slung vertically, the strap resting on the shoulder away from the dragrope.

To Unsling Arms.

1803. Arms being Slung: 1. **Order (right shoulder, etc.)** 2. **ARMS**. At the second command, unsling arms and take the position directed.

To Form Platoon to the Front.

1804. The drag being manned: 1. **Platoon to the front**, 2. **MARCH**. (1) At the first command, men drop toggles and unsling arms; even numbered dragmen stand fast, odd numbered dragmen step into place ahead of their toggle mates, forming a normal infantry platoon faced by the flank; the gun squad closes and takes proper position in rear of drag squads; the 1 p. os. take post as leading and rear guides.

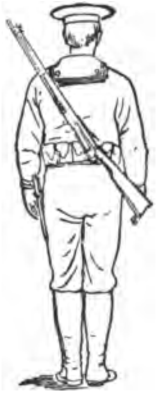

FIG. 154.

(2) At the second command, the platoon executes **column right**, the guide taking the half step. When the rear guide has completed the turn the pt. c. commands: 1. **Platoon**, 2. **HALT**, 3. **Left**, 4. **FACE**.

(3) The pt. c. dresses the platoon to the right, if in a single company; to the center, or toward the colors, if in battalion; and then takes his post 3 paces in front of the center of the platoon.

To Man the Drag.

1805. The platoon being **to the front**: 1. **Man the drag**, 2. **MARCH.**

(1) At the first command, the platoon faces to the left and slings arms.

(2) At the second command, the platoon changes direction to the left along the drag, and odd numbers oblique to the left into position. The dragmen halt at their stations, face to the front and pick up the toggles. The p. os. and men of the gun squad take their posts.

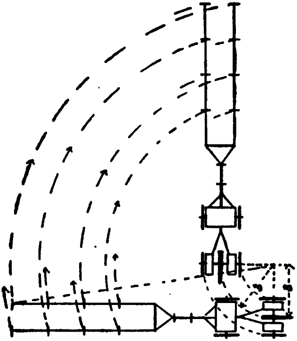

FIG. 155.

1806. When the drag is manned the platoon executes the **halt, rests, steps,** and **marchings, resumes attention, changes direction slightly, obliques,** and **resumes the direct march,** as prescribed for infantry, with the modifications noted below:

(1) In executing **halt,** Nos. 1, 2, 3, 4 check the motion of the piece and limber; the drag leaders stretch taut the drags.

(2) In **incline to the right (left),** the drag leaders take the new direction followed by the other numbers.

(3) In **right (left) oblique,** the movement is executed in the same manner as the incline, except that the change is 45°.

To Change Direction.

1807. The drag being manned, marching or at a halt: 1. **Right (left) turn** (or **half turn**), 2. **MARCH.**

(1) **With limber.**—At the second command, the leaders turn to the right in **double time,** gaining ground so that the piece turns in a circle of 3 yards radius; the other men so regulate their step as to complete the movement **at the same time as the leaders.**

(2) Upon the completion of the turn, the men take up the march in the same cadence as before the turn.

(3) **Without the limber:** *Modifications:* The leaders turn to the right in double time **leaving the drags slack**; other numbers so regu-

late their step as to **complete the movement with the leaders**; 1 and 2 raise the trail until the trail wheel is well clear of the ground, and turn the piece, assisted by 3 and 4 at the check ropes.

(4) In any case, the dragmen and gun squad must be careful not to attempt to turn the piece too soon, or by pushing on the dragrope, force the drag leaders to take a faster gait than **double time**.

To March to the Rear.

1808. The drag being manned: 1. **Right** (left) **about**, 2. **MARCH.** Executed as prescribed for **Right** (left) **turn**, except that the change of direction is 180° instead of 90°.

To Move the Piece a Short Distance by Hand.

1809. The drag being manned: 1. **Rear by hand**, 2. **MARCH.**

At the second command, all the men face to the rear, those at the piece and limber moving them backward until the command, **halt**, is given, when all face to the front. If necessary, men from drags may be detailed to assist on wheel drags of piece and limber.

1810. Being in battery: 1. **Front (rear) by hand**; 2. **MARCH.**

At the second command, the gun squad moves the piece and then the limber as directed; after which 5, 6, 7, 8 move the ammunition boxes.

To Prepare for Action.

1811. The drag being manned, the piece is swung with the muzzle pointed in the desired direction, if not already there.

The pt. c. then commands: 1. **In battery**, 2. **MARCH.**

(1) **With limber**: At the first command, 1 and 2 unhook trail of piece from limber, 3 and 4 assisting; 5 and 6 unhook dragropes from limber; all dragmen drop the drag; the rear squad of dragmen drop back and prepare to shift the limber; 5, 6, 7, 8 drop back to the piece; dragmen, except the rear squad, unsling arms, odd numbers step into place as at **platoon to the front**, forming column of twos; the junior 1 p. o. becomes support leader and takes post abreast the drag leaders; the senior 1 p. o. becomes gun captain and prepares to supervise placing the limber and getting ready for action.

(2) At the second command or as soon as praticable, if the command **march** has already been given, the rear squad of dragmen swing the limber into position, 1 foot to the left of the piece, with the axle 1 foot to the rear of the axle of the piece, pole pointing to the front;

then take post in rear of the other squads of dragmen. The support leader conducts the supports to the rear (for drill, 30 paces in rear of the piece), changes direction to the left, halts the support, faces them to the front, and deploys them on the right squad; 5 and 6, take off left ammunition boxes from the piece; 7 and 8, the right ammunition boxes, and place them on the ground in one row in rear of, and close to, the limber; all the members of the gun squad then perform the detailed duties given below and complete preparation for action; the gun captain takes station 2 paces in rear of the limber.

(3) When no ammunition is carried on the piece (as in Mark VII and Mark XI guns), 5 and 6 stay with the limber, but are assisted by the rear drag squad; 7 and 8 assist in placing trail and bedding spades.

(4) **Without limber:** *Modification:* At the first command the drag-ropes are dropped in place, the span is unhooked by Nos. 7 and 8, and span and cross bar placed clear of the trail. At the second command, 5, 6, 7, and 8 remove boxes from the piece and place them to the left of the piece; 1 and 2 unship trail wheel. All squads of dragmen are conducted to the rear at once. Other stations and movements are the same as with the limber.

(5) If the rifles of the gun squad interfere with their duties, they may be laid or stacked clear of the piece before or after casting the piece loose.

(6) If desired, 7 and 8 may be directed to coil down the drag ropes.

To Prepare the Piece. Detailed Duties.

1812. The detailed duties vary somewhat according to type of gun. For Mark I mod. 1, Mark IV and Mark XI guns, the pointer does the firing; for Mark VII gun the plugman does the firing, at the command of the pointer; Mark I, mod. 1, has a brake for each wheel; the other types have no brakes, though brakes are being fitted to Mark VII. Marks VII and XI have gun shields, seats for pointer and plugman, and panoramic sights; the other types have no shields, no seats, and open or peep sights; the location of the hand wheels for elevating, training, etc., varies; and there are other differences. (See also "Detailed duties in the Service of the Piece," Article 1852, *et seq.*)

Gun captain. Supervises preparations; reports when gun is ready.

No. 4 (pointer). Releases the training and elevating locks, if fitted, and tests training and elevating gear; provides and places the sights of whatever type supplied, so far as these are not habitually carried on the gun (the panoramic sight is always carried in its case); centers cross level bubble of sight, if fitted, to correct for difference in level of wheels; sets deflection on peep and panoramic sights at zero; raises top shield with the assistance of No. 1; provides lanyard if he is to fire; seats himself on gun seat, if any.

No. 1 (plugman). Assists pointer to raise top shield, if fitted; provides and places the gun quadrant, if supplied, sets sight at 300, and centers both range (rocker) and cross level bubbles, if on his side, tests elevating gear if on right side of gun; provides wiping cloth; operates the breech mechanism, examines breech block and bore, cleaning any parts requiring it, and leaving breech open; provides a lanyard, if he is to fire; seats himself on gun seat, if any.

No. 2 (trainer). Establishes the trail; if split trail type, uncouples trail flasks and separates as far as they will go, assisted by 7 and 8; removes breech cover; ships trail handspike, if fitted, assists No. 3 to lower the piece apron, if any;

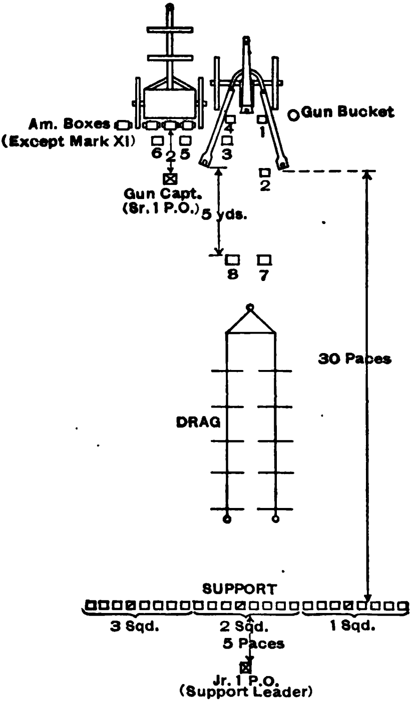

FIG. 156.

sets right wheel brake, if any; distributes waste or cotton to the gun squad for their ears; takes station by the trail.

No. 3 (loader). Removes the muzzle cover and tompion; assists No. 2 to lower the piece apron; assists No. 4 (if necessary) by placing the front sight; takes gun bucket and places it on the ground, 2 paces to right of the breech of the gun (the bore sponge is left in place until required); sets the left wheel brake; takes station on left of breech and stands by to receive a round from No. 6.

No. 5 (shellman). Equips himself with hand fuse setter, if provided (otherwise with fuse punch, or wrench, and *range-time of flight* table); takes station in rear of limber, and stands by to set fuses.

No. 6 (shellman). Opens ammunition box, takes out a round preparatory to having the fuse set.

No. 7 and 8 (shellman and supernumeraries). Assist in placing and opening ammunition boxes, assist No. 2 to separate trail flasks (Mark XI) and bed spades; then take station 5 yards in rear of piece to act as supernumeraries.

All members of gun squad take cover, so far as is practicable, behind piece and limber.

To Man the Drag.

1813. Being in battery: 1. **Man the drag,** 2. **MARCH.**

(1) **With limber.** At the first command the support is assembled and arms slung. 1, 2, 3, and 4 prepare the piece and accessories for the march and for limbering up; 5, 6, 7, and 8 replace ammunition boxes on the piece and limber, and prepare the limber for march.

(2) At the second command, the supports are conducted to the drag, in double time; the rear drag squad assists 5, 6, 7, and 8 to place the limber in position and leads out the drag (if necessary); 1 and 2 hook the trail to the limber; 5 and 6 hook the drag ropes; the dragmen pick up and stretch taut the drags.

(3) **Without limber:** *Modifications:* 7 and 8 lead out the drag ropes; 5 and 6 hook drag ropes to the trail; 1 and 2 raise trail and secure trail wheel in place.

(4) In securing the piece, each member of the gun squad returns what he provided, and secures what he cast loose, with the following modifications:

No. 4 sets the panoramic sight deflection at zero before returning it to its case; lays the piece in mid-position and levels it, then secures gun with traveling lock, if provided.

No. 1 closes the breech and releases the firing pin, if cocked (Mark I, mod. 1, and Mark XI are repeating percussion type).

Nos. 5 and 6 set fuse of any round, whose fuse has been set, back at safety before returning to box.

Nos. 7 and 8 assist in returning unused rounds of ammunition and in securing boxes; also in coupling trail flasks (Mark XI).

To Prepare the Platoon for Action to the Front, Right or Left.

1814. (1) If the character of the ground is such that a piece can not be swung as desired when limbered up with drag manned, the pt. c. may prepare for action by giving the following commands:

1. **In battery, action front (right or left),** 2. **MARCH.**

(2) At the first command, the procedure is the same as for going in battery in the regular manner.

(3) At the second command, 1, 2, 3, and 4 swing the piece to point in the indicated direction; the rear squad of dragmen move the limber to its position on the left of the piece; 7 and 8 shift the drag ropes. Other details are the same as for going in battery in the normal manner.

(4) The direction **front, right** and **left** here refer to the direction in which the platoon is moving at the time the order is given, not to the direction when unlimbered.

To Fire to the Right (Left or Rear).

1815. Being in battery: 1. **Action right (left** or **rear).** 2. **MARCH.**

(1) **With limber.**—At the first command, 1, 2, 3, and 4 prepare to turn the piece in the new direction; 5, 6, 7, and 8 move the loose ammunition boxes clear of the intended movement and prepare to move the limber to the front or rear according as the trail of the piece is to move toward or away from the limber.

(2) At the second command, the limber is moved clear of all interference with movements of the piece and the piece is turned in the designated direction by the crew; 5, 6, 7, and 8 then reestablish the position of the limber and ammunition boxes. The entire squad should conduct the movements of limber and piece if necessary. The support is conducted to newly assigned positions by the support leader.

The Firings.

1816. The firings and the detailed duties in the service of the piece are given under "Control of Fire," Articles 1853 to 1861, and 1878 et seq.

Descent of Inclines.

1817. An incline too steep for the pieces to be handled in the normal manner is descended as follows:

(1) **Moderate inclines**: The platoon is halted. The pt. c. commands: 1. **Reverse the drags**, 2. **WALK BACK.**

At the first command 5 and 6 unhook the span from the limber; the leaders followed by the other numbers on the drags, double back to the right; 4 hooks the span to the drag-hook or eye on axle of piece; and 3 and 4 shift rear-drags to the wheel-lugs of piece. At the second command 5, 6, 7, and 8 guide the limber; 1, 2, 3, and 4 assist on wheel-drags; men on the drags take the weight of piece and limber.

(2) **With a less incline**, it may only be necessary for 3 and 4 to put on brakes without reversing drags. **With a greater incline**, the drags may be reversed as in (1), and the brakes may also be used.

(3) **A very steep incline.** Unlimber; reverse the drags on the limber, then the piece, sending each down separately. Where the declivity is rough and the trail apt to catch, hook the drags to the trail of piece and walk back.

(4) **If the declivity is especially difficult**, unlimber, hook the left drag to the right, and the right drag to the tongue of limber; then to the trail of piece, sending limber and piece down separately, all numbers manning the long single drag and walking back. In all doubtful cases, remove the ammunition boxes and pass them down separately.

To Dismiss the Platoon.

1818. The gun and limber being housed, parked, or secured the platoon is formed **to the front**; the pt. c. inspects the piece, limber, and platoon, and then directs the senior 1 p. o. to dismiss the platoon; or, the platoon may be dismissed from the position of **in battery**; such parts as directed, being secured.

Sec. III.—SCHOOL OF THE COMPANY.

General Rules.

1819. (1) The company consists of two, three, or four platoons organized as prescribed in the School of the Platoon.

(2) In column the distance between platoons is 4 paces; in line the interval between platoons is equal to the length of the drag ropes, pieces, and limber (platoon length) plus 4 paces.

(3) The c. p. o. and musicians (messengers) are armed with the pistol; other enlisted men are normally armed with the rifle, except for permanently organized companies, where duty away from the piece is improbable; in the latter case the gun squad may be armed with the pistol.

(4) The signals with the sword, arm, or whistle, as prescribed for infantry, may be used for artillery as far as practicable.

1820. The company has the same formations as the platoon, namely: **platoons to the front, at the drag, and in battery**; when in formation **platoons to the front,** the platoons may be separate, or may be combined into a normal infantry company; when **at the drag,** the platoons may be in line or column.

The Formation in Line.

1821. The c. c. is 6 paces in front of the center of the company. The pt. cs. are on the left of the platoon guides. The c. p. o. (if not leader of a platoon) is opposite the center of the company in line with the rear guides. The fire control detail (when separately organized) is on the left of the c. p. o.

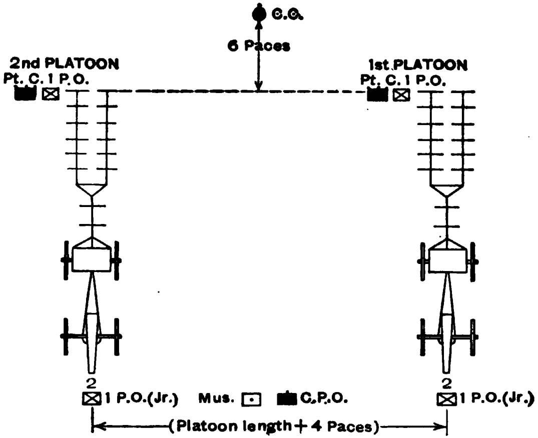

FIG. 157.

The Formation in Column.

1822. The c. c. is 6 paces from the column, on the flank. The c. p. o. (if not a platoon leader) is opposite the center of the column and 1 pace from it, on the side away from the c. c. The fire control detail (when separately organized) is in rear of the c.p.o.

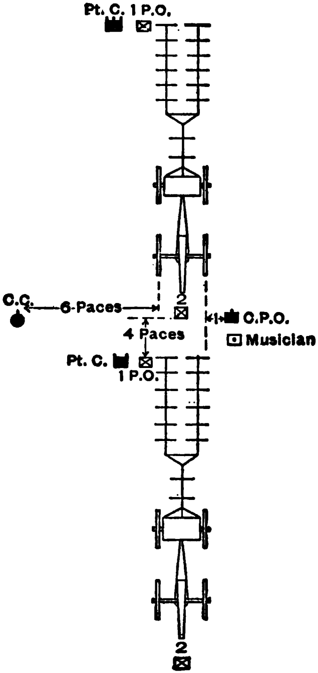

FIG. 158.

To Form the Company.

1823. The company is formed at the command: **Fall in at the drag (platoons to the front, or company to the front).** If formed other than as a company to the front, each pt. c. forms and takes command of his platoon, and at the command **report** by the c. c., reports **first (or other) platoon, formed, Sir.**

The Marchings, Rests, etc.

1824. Being in line or column, the company executes the **halt, rest, steps, and marchings, resumes attention,** etc., as explained in the School of the Platoon.

Simultaneous Movements.

1825. (1) Simultaneous movements to the flank or rear are executed by the commands: 1. **Platoons,** 2. **Right (left) turn (right or left about, etc.),** 3. **MARCH.**

(2) **Right (left) oblique** is executed simultaneously by each platoon, in line or column.

(3) **Platoons to the front, and in battery,** are executed simultaneously by each platoon, from line only. **Man the drag,** is also executed simultaneously from either of the above formations.

To Form the Company to the Front.

1826. Being in the formation **platoons to the front,** the normal infantry company is formed by the commands: 1. **Form Company,** 2. **On first (or other) platoon,** 3. **MARCH.** Each pt. c. causes his platoon to close on the designated platoon; pt. cs. and interior guides take post in the file closers, as in the School of the Infantry Company.

Movements from Column.

1827. Being **in column,** the company executes the following successive movements:

(1) **INCLINE TO THE RIGHT (LEFT).**

The leading platoon changes direction as indicated, followed by each following platoon when it arrives at the turning point.

(2) 1. **Column right** (left), 2. **MARCH.**

The leading platoon executes **platoon right turn,** followed by the other platoons, as they arrive at the turning point.

(3) 1. **Right** (left) **front into line,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The leading platoon takes up, or continues the march; other platoons execute **right oblique** and resume the original direction when abreast of their places, and halt on the line.

(4) 1. **On right (left) into line,** 2. **MARCH,** 3. **Company,** 4. **HALT.** The leading platoon executes **right turn;** other platoons continue the march until abreast of their places, then execute **right turn,** and halt on the line.

Movements from Line.

1828. (1) 1. **Company,** 2. **Right** (left), 3. **MARCH,** 4. **Company,** 5. **HALT.** The pivot platoon executes **right turn,** other platoons **execute right half turn,** twice. The command **halt** is given when the pivot platoon has advanced the desired distance. The pivot platoon halts, other platoons halt successively on the line.

(2) 1. **Right** (left) **by platoons,** 2. **MARCH.**

The indicated platoon moves to the front, other platoons execute **right oblique,** and each when in place in column executes **forward march.**

To Extend or Close Distance or Interval.

1829. Being in any formation. 1. Extend (close), 2. **On first (or other) Platoon, 3. To (so many) paces, 4. MARCH.** Executed by appropriate commands of the pt. cs., the base platoon halting.

To Prepare for Action in any Direction.

1830. If in line with the muzzles pointed toward the target, the command is given 1. **In battery,** 2. **MARCH,** and is executed by each platoon separately. As this command calls for a simultaneous movement, it is not given in the middle of an evolution.

1831. (1) **In any other formation,** the company is first maneuvered, in the most convenient manner, so that the line of pieces is at right angles to the bearing of the target. At any time after the first platoon is established the command is given 1. **Action front (right, left,** or **rear),** 2. **MARCH.**

(2) The first command designates the direction of the target with reference to the front of the platoons when they are established in the new line (or column).

(3) At the second command each pt. c. swings his platoon until the muzzle of the piece is pointed in the designated direction and then goes **in battery.** In successive formations, platoons which have not reached their positions complete the evolution before going in battery. In difficult ground, or where otherwise desirable, the pt. c. may go **in battery, action front (right or left),** without first swinging his platoon.

(4) For example, being in column, with the target directly ahead, the commands may be given 1. **Right front into line,** 2. **MARCH,** 3. **Company,** 4. **HALT,** 5. **Action front,** 6. **MARCH.** The third and fourth commands may be given as soon after the second as desirable; the fifth and sixth, immediately after the fourth.

To Change the Direction of Fire.

1832. (1) Being **in battery**: to change the direction of the fire radically to the right (left): 1. **Action right (left),** 2. **Change front forward (by the rear) on the right (left or other) piece,** 3. **MARCH.**

(2) At the third command the piece designated as base piece is turned sharply in the direction indicated, executing **action right,** as explained in the School of the Platoon. Other pieces are conducted in the most convenient manner (manning the drag, if the distance be long or the ground difficult) to the appropriate positions on the new line.

(3) If the piece on the flank toward which the turn is to be made is designated as base piece, it can open fire immediately after turning; if on the other flank, its fire will be blanketed for a time by the other pieces.

(4) If the command be **action right**, changing front forward on the right piece, or by the rear on the left piece, preserves the order; by the rear on the right piece or forward on the left piece inverts the order. For **action left**, the opposite holds true.

The Firings.

1833. Fire is conducted as described under "Control of Fire," Article 1878 et seq.

To Dismiss the Company.

1834. The c. c. commands: **Dismiss your platoons.** Each pt. c. then dismisses his platoon as prescribed in the School of the Platoon.

Sec. IV.—SCHOOL OF THE BATTALION.

1835. (1) The battalion is composed of two or more companies organized as prescribed in the School of the Company.

(2) When formed in column of platoons, the distance between companies is 8 paces.

When formed in line, the interval between companies is equal to platoon length plus 8 paces.

When in column of companies (or other compound formation), the the distance (or interval) between guide platoons is the same as between these platoons when in the corresponding simple formation of column (or line).

(3) In rendering honors when maneuvered with infantry, the drag leaders may be in line with the front rank of the infantry, or with platoons or companies **to the front**, in which formation the c. cs. are in line with the company officers. The artillery is at the left of the infantry in line or at the rear in column.

(4) The post of the bn. c. is 20 paces in front of the center of the line, or on the flank of the column.

(5) The staff and staff p. os. are the same as for a battalion of infantry, and their posts are the same.

(6) Men at the drag do not execute the manual in ceremonies. In presenting the battalion men armed with the pistol, when not at the drag, execute the hand salute at the command **present arms (or swords)**.

Formations.

1836. The battalion may be in the formations platoons or companies **to the front, at the drag,** or **in battery.** When at the drag they may be in **line** or **column**; or the compound formations, **column of companies,** or **line of companies in column of platoons.**

To Form the Battalion.

1837. The battalion is formed in the same manner as the battalion of infantry, either in line or column.

The Marchings, Rests, etc.

1838. The battalion executes the **halt, rests, steps,** and **marchings, resumes attention, preserves alignments, obliques, resumes the direct march, changes direction,** goes **in battery, mans the drag,** goes **platoons to the front, extends** and **closes intervals** and **distances,** as prescribed in the School of the Company.

Simultaneous Movements.

1839. The battalion executes simultaneous movements as prescribed in the School of the Company, prefixing, when necessary the command **platoons,** or **companies** to the command as appropriate.

Successive Movements.

1840. Being in **column of platoons,** the battalion executes the following successive movements:

(1) **Right** (left) **front into line,** 2. **MARCH.**

The leading company executes **column right,** then **platoons left turn,** and halts. Other companies execute **column half right twice,** then **platoons left turn** and halt on the line established.

(2) 1. **On right** (left) **into line,** 2. **MARCH,** 3. **Battalion,** 4. **HALT.**

The leading company executes **platoons right turn.** Other companies continue on, and successively execute **platoons right turn,** and halt on the line.

(3) 1. **Column of companies,** 2. **First company, platoons right** (**left**) **turn,** 3. **MARCH.** Each company in turn executes the movement when it arrives at the turning point.

1841. Being in **column of companies,** the battalion executes the following successive movements:

(1) 1. **Right (left) front into line,** 2. **MARCH.**
Executed as for infantry (Art. 1795 (3)).

(2) 1. **On right (left) into line,** 2. **MARCH,** 3. **Battalion,** 4. **HALT.** Executed as for infantry (see Art. 1795 (3)).

(3) 1. **Column of platoons,** 2. **First company platoons right (left) turn,** 3. **MARCH.** Executed as for infantry.

To Prepare for Action.

1842. Executed in the same manner as prescribed in the School of the Company.

The Firings.

1843. The firings are conducted as described under "Control of Fire" (Art. 1878, et seq.). Battalion commanders exercise **fire direction**: the **conduct of fire** is left to company commanders or fire control officers, except for firing salutes.

Battalion Review.

1844. Executed as for infantry, except that the battalion is formed **platoons to the front** for the presentation and inspection, and mans the drag preparatory to passing in review.

To Dismiss the Battalion.

1845. Executed as for infantry.

Sec. V.—CONTROL OF FIRE.

1846. Control of fire, in its broad sense, includes the choice and assigment of targets and positions, including observing stations, called **fire direction**; the preparation of fire and detailed fire control of the company (or battery) as a unit, called **conduct of fire**; and the detailed duties of the gun squads in the service of the piece, classed as **fire discipline.**

1847. Fire direction is the function of battalion (or higher) commanders; conduct of fire the function of company commanders (or fire control officers of batteries larger than a company); fire discipline is under the supervision of the senior pt. c. of each company.

1848. Fire is said to be **direct,** when the target itself is in sight from the guns, and serves as point of aim; **indirect,** when some other object is chosen as point of aim; the target itself being usually not visible from the guns.

Guns fitted with panoramic sights may be used for either direct or indirect fire; guns not fitted with panoramic sights are best suited for direct fire, though indirect fire may be improvised, in a manner to be explained hereafter. The fire-control methods described apply directly to guns fitted with panoramic sights, but the principles are true for any type of sight, and may be applied to any gun, so far as the limitations of equipment permit.

Duties of Officers.

1849. The general duties of officers are given in articles 1790-1792, and will be discussed in greater detail hereafter.

Fire-Control Detail.

1850. The fire-control detail assists the c. c. in controlling the fire of his guns. The size of this detail depends on the equipment supplied. If the outfit includes no instruments, ordinarily the c. p. o. and one or two scouts are sufficient, unless indirect laying is to be used. If full equipment of instruments and telephones is supplied, the detail may be as follows:

(1) One **instrument p. o.**, to set up the battery commander's telescope, and to assist in calculating, recording, and transmitting firing data, and to take general charge of the fire-control detail.

(2) One **instrument assistant**, to operate the range finder or other instrument, and to assist as above.

(3) One **telephone p. o. and two operators**, to lay out the telephone line from the observing station to the guns. The telephone p. o. sees that the line is in working order, reports to the c. c. when communication is established, and thereafter takes especial care that the line is not cut or communication interrupted. The operators take station at each end of the line.

The **company musicians** act as signalmen and **messengers** (or agents).

(4) Two **scouts**, to assist in establishing communication, act as route markers, and to observe the target and the terrain in the sector assigned to the company, reporting all changes, also to keep an eye on the flanks. If not required elsewhere, one scout may be assigned to record data for the senior pt. c.

1851. At **in battery**, the fire-control detail provides and sets up the fire-control instruments at the location chosen for the observing station, and establishes communication with the battery. For drill purposes, unless otherwise directed, the station may be taken as 10 paces in rear of the trails, abreast the center of the battery.

Detail Duties in the Service of the Piece.

1852. The duties differ according to the type of gun (see art. 1794). They are indicated in a general way only. For further details of the guns, etc., and especially the panoramic sight and range quadrant, see Ordnance pamphlet "Handbook of 3-inch Field and Landing Guns, etc."

1853. The guns being **in battery** and prepared for action, as prescribed in articles 1811 and 1812, the detailed duties in the service of the piece are as follows:

Gun captain.

1. Supervises and is responsible for all the details of correct service by the gun squad.
2. Makes sure of the identification of his part of the target or of the aiming point.
3. Keeps informed of the firing data so as to be able to repeat any parts not understood by the gun squad, but does not repeat anything unless it is called for by a subordinate If he does not understand any part of the order, he asks for it thus: Site Corrector, etc.
4. Sees that the members of the gun squad **stand clear of the gun for the first two or more shots,** as necessary.
5. Extends his right arm vertically as soon as the pointer calls "ready," so as to indicate that the piece is ready to fire. Lowers his hand as the pointer fires (or calls "fire").

1854. No. 4 (Pointer).

1. To set the deflection.
2. To apply the deflection difference.
3. To level the cross-level bubble, thus correcting for any difference in level of wheels.
4. To lay the gun for direction (using traversing handwheel, and having trail shifted, if necessary).
5. **For direct fire,** to lay the gun for angle of site when No. 1 has reported **set** (using rocker elevating handwheel). This is done by bringing cross wires on target.
6. Hooks lanyard or grasps firing handle.
7. To call **ready,** when gun is laid and ready to fire.
8. To move his head out of the way of the sight before the gun is fired.

9. To fire at the correct time.

10. To measure a deflection to a given aiming point, the gun being laid.

It is important that pointers **first** set the deflection ordered and then apply the deflection difference; this results in greater accuracy and rapidity than attempting to make the calculation mentally. In laying for direction, when he reaches the limit of the arc of train he calls **shift the trail, muzzle right** (left) to No. 2, and brings his piece back to the center of traverse, except that, in firing at moving targets, the gun is moved as far as it will go in a direction opposite to that of motion of the target.

Modifications, Mark I, mod. 1. Omit: 1, 2, 3, 4, 5, 6, 8, and 10. Add:

3a. Sets the range.

5a. Looks over sights and directs No. 3 to train and elevate until gun is laid.

6a. Passes lanyard to No. 1, who hooks it.

Modifications, Mark IV. Omit: 2, 5, and 10. Add:

3a. Sets the range.

5a. Lays the piece for elevation.

Modifications, Mark VII. Omit: 5, 6, and 9. Add:

3a. **For direct fire,** sets the range.

5a. **For direct fire,** lays the gun for elevation.

9a. Calls fire at the proper time.

1855. No. 1 (Plugman).

1. To open and (if necessary) to close the breech, leaving it open except when gun is loaded.

2. Examines plug, wipes off when necessary.

3. **For direct fire,** sets index at 300 on site scale; for **indirect fire,** centers rocker-level bubble (using rocker elevating handwheel), then sets index at angle of site directed.

4. Elevates gun (using gun elevating handwheel) until index points at range ordered.

5. Calls set when gun is laid, so far as it is assigned to him to do it.

Modifications, Mark I, mod. 1. Omit: 3, 4, and 5. Add:

2a. Hooks lanyard after breech is closed, unhooks it after opening breech (before, if gun is loaded).

Modifications, Mark IV. Omit: 3, 4, and 5.

Add:

2a. Assists pointer, if desired, in training piece.

Modifications, Mark VII. Omit: 3 and 4.

Add:

3a. Sets the range and site on the quadrant.
3b. Centers range and cross-level bubbles of quadrant.
4a. In **indirect laying**, gives the elevation.
6. To hook the lanyard if it is to be used.
7. To fire the piece at the command of the pointer.

1856. No. 2 (Trainer).

1. Shifts trail, when directed by pointer (assisted by 7 and 8).
2. Beds or raises spades (assisted by 7 and 8).
3. Extracts empties, or catches them when ejected from gun, and throws them clear of the gun squad.

1857. No. 3 (Loader).

1. To receive a round from No. 6.
2. To insert the round in the breech.
3. In **volley fire** to call out the number of the round, thus (if for three rounds): "**First round, second round, third and last round.**"

Modifications, Mark I, mod. 1.

Add:

2a. To elevate and train for pointer when he is at end of lanyard.

1858. No. 5 (Shellman).

1. To set the range and corrector on the hand fuse setter, if supplied.
2. To set the fuse (for time fire), assisted by No. 6.
3. If fuse punch or wrench is used, to refer to **range time of flight** table and set fuse for the range, unless otherwise ordered.
4. **To use the hand fuse setter**, set the range and corrector scales as ordered, and clamp; strip off the fuse cover; place the fuse setter over the point of the shrapnel and turn the handle of the fuse setter in a **clockwise direction** until the rotating pin of the fuse engages in the notch of the range ring carrier; then press the fuse setter firmly on the fuse, and continue to turn until the lug in the fuse setter base engages with the stop pin in the fuse body and prevents further rotation.

1859. No. 6 (Shellman).

1. To take a round from the box.
2. To hold the round for No. 5 to set the fuse (time fire).
3. To pass the round to No. 3.

1860. Nos. 7 and 8 (Shellman and Supernumeraries).

1. Assist No. 2 in shifting trail, bedding and raising spades.

2. Start construction of artificial cover, if directed. (See Art. 1170).

Modifications, Mark I, mod. 1, Mark IV and Mark VII. Omit: 1. Add:

1a. Assists in getting ammunition boxes ready, opening, etc., as necessary.

1b. Assists No. 2 in shifting trail, when necessary, and in bedding spade.

General Instructions.

1861. When **in battery,** the breech of the gun is left open except when the gun is loaded.

The gun is loaded at the command giving the method of fire, i. e., **first piece only; battery in succession from the right,** etc., or as soon thereafter as the fuse can be accurately set.

The command for firing, by the c. c. or senior pt. c. is usually accompanied by bringing the right arm from a vertical position quickly down to the side. In salvo fire, the pointer waits until it is his turn to fire.

All the gun squad **stand clear of the piece for the first round,** which is always fired with the lanyard, and for succeeding rounds, until the spade is well bedded.

In hard ground the recoil is apt to be excessive, especially for the Mark IV and Mark VII guns, which have no brakes. A trench should be dug for the spade, if necessary. In firing with the gun depressed, the piece is liable to jump clear of the ground, especially the Mark IV.

CHAPTER VI.

ARTILLERY IN THE FIELD.

Sec. I.—DEFINITIONS.

1862. Angle of elevation: The angle between the plane of site and the axis of the bore.

Angle of fall: The angle between the plane of site and the tangent to the trajectory at the point of fall.

Angle of incidence: The angle betwen the plane of the surface struck and the tangent to the trajectory at the point of impact.

Burst center, center of burst, or mean point of burst: The point about which the points of burst of several projectiles are evenly distributed.

Burst interval: The distance in the plane of site from the point of burst to the target.

Burst range: The distance from the muzzle of the gun to the point of burst.

Counterslope: A slope which descends toward the enemy and is wholly or partially hidden from him by the covering crest of the reverse slope.

Crest: The summit of a ridge.

Danger space: The distance, in the plane of the slope considered, over which an object of a given height would be struck.

Deflection: The angle between two vertical planes containing, one the line of sight, and the other the axis of the bore.

Direct laying: Pointing the gun for direction and elevation by directing the line of sight upon the target.

Drift: The departure of the projectile from the plane of fire due to its rotation and to the resistance of the air.

Height of burst: (1) The vertical angle between the plane of site and a right line joining the muzzle of the gun and the point of burst. (2) The ordinate of a point of burst.

Indirect laying: Pointing the gun for direction by directing the line of sight upon an objective other than the target, and for elevation by the use of a quadrant or elevation level.

Line of sight: The right line passing through the sights and the target or the aiming point.

Mil: The unit of angular measure, one sixty-four-hundredth of a circle. The arc which subtends a mil at the center of a circle is, for practical purposes, equal to one one-thousandth of the radius. The arc and its tangent are nearly equal for angles not greater than 330 mils.

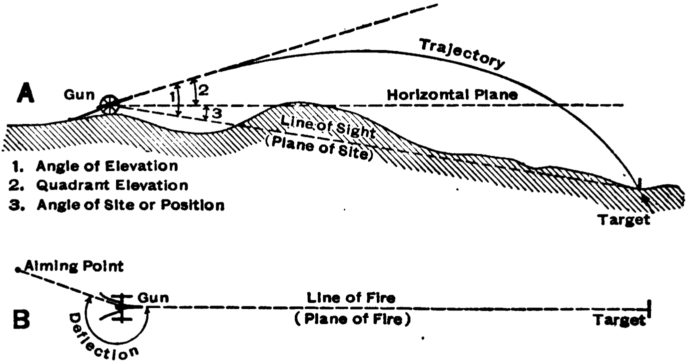

FIG. 159.

Military crest: The line nearest a crest from which all the ground toward the enemy may be seen and reached by fire.

Ordinate: The distance of a point of the trajectory from the plane of site. The **maximum ordinate** is the ordinate of the highest point of the trajectory.

Parallax: The angle at any point subtended by any given line; usually the line connecting two adjacent guns of the same battery.

Plane of fire: The vertical plane through the line of departure; also called **plane of departure**.

Plane of site: A plane containing the right line from the muzzle of the gun to the target, and a horizontal line perpendicular to the axis of the bore at the muzzle.

Point of fall, of impact, or of graze: The point where the projectile strikes.

Quadrant elevation: The angle between a horizontal plane and the axis of the bore when the gun is laid.

Range: The distance from the muzzle of the gun to the target.

Reverse slope: The slope which, from the direction of the enemy, is hidden by a ridge of which the slope is a part.

Site: The angle between a horizontal plane and a right line joining the muzzle of the gun and the target; called also the **angle of position.** The origin of sight scales is taken at 300.

Time of flight: The time in seconds required for the projectile to travel from the muzzle of the gun to any point of the trajectory—usually to the point of fall or of burst.

Trajectory: The path described by the projectile in its flight.

Positions.

1863. Artillery may be posted for **immediate action, in observation,** or **in readiness.**

When posted for **immediate action** the guns are unlimbered and fire is opened as promptly as possible upon the indicated targets.

When posted **in observation** the guns are unlimbered and all preparations made for opening fire at the desired moment upon the existing or expected targets.

When posted **in readiness** the guns are not unlimbered. They are held under cover near a position for possible immediate action, but so that they can be moved quickly to another locality if the situation requires. In the meantime the immediate tactical situation is studied.

1864. Positions are defined as **masked** or **in the open,** according as they afford concealment from the hostile position or not.

(*a*) If the guns are posted so that through the sights the hostile position can be seen over the mask, they are said to be **in the open.**

(*b*) If where a dismounted man can just see the hostile position over the mask, they are said to have **dismounted defilade.**

(*c*) If so that the flash of the gun will be concealed from the hostile position, to have **flash defilade.**

1865. Defilade may be taken against the target to be attacked; but preferably, against the highest position from which enemy parties can effectually observe.

1866. A defilade of 12 feet is sufficient to conceal the flash of the gun by day. A defilade greater than this is still referred to, however, as **flash defilade**.

Observing Stations.

1867. The officer conducting the fire should choose his observing station so that he can see all of his sector and as much as possible of the adjoining terrain.

To facilitate the transmission of orders and the proper exercise of command the station should be as near the guns as the conditions permit. This may often be accomplished by using elevated observing stations, such as trees, buildings, etc., or a specially prepared ladder or tower. He preferably takes a position on the windward flank in order that his view may not be cut off by dust and smoke and that his voice may carry more certainly.

1868. But the proximity of other batteries, the advantage of flash defilade, and of withdrawing the guns from their mask to reduce the chance of their being reached by searching fire, and the compelling necessity of observations may impose a station remote from the guns. In such a case reliable communication must be established and maintained.

1869. If the station is in immediate proximity to the guns or is apt to be subjected to the enemy's searching fire, suitable protection from hostile fire should, whenever possible, be provided for the observing officer.

Designation of Objectives.

1870. Objectives must be designated in a prompt, concise, and unmistakable manner.

1871. If targets are distinct and clearly defined, they may be designated by name. If a target is indistinct, poorly defined, or masked, then an area may be designated for attack, the nature of the target being invariably given.

1872. In designating objectives the following procedure is appropriate, especially when the objective is not conspicuous or readily recognized:

Define the **relative position** of the objective by giving the approximate direction and distance of the objective and its location with respect to a prominent feature of the landscape as a **reference point.** Then give its important **characteristics**, such as its nature, shape, and color. Sometimes the **site** of an objective will simplify its designation.

1873. Directions may be indicated by pointing; by the use of military terms such **as to our left front**; by use of imaginary hour marks on an artificial horizontal clockface the center of which is at the position of the speaker, and the 12 o'clock mark directly to the front of the position or at a reference point; by the similar use of a vertical clockface whose center is assumed to be at a reference point; by the points of the compass.

1874. The location of an objective may sometimes be fixed by coordinates.

1875. If the objective is in itself inconspicuous, it is usually best to designate first the most prominent object in its general direction, then to give the angular distance between this reference point and the real objective and then to give the distance to and description of the latter.

Thus:

1. At 2 o'clock horizontal.
2. At 3,000 yards a large stone house, square, two storied, with a cupola on top.
3. Five hundred mils to the right of the cupola.
4. At 2,500 yards a light battery in position in rear of the large orchard.

Or:

1. Northwest.
2. At 5,000 yards two symmetrical hills of the same height.
3. The left peak the reference point.
4. At 7 o'clock vertically, a field of brown weeds.
5. In that field, a machine-gun battery.

Or:

1. The lone tree on Artillery Ridge.
2. Two hundred yards south and four hundred yards west, a bare stretch of road.
3. Beyond the road, machine guns.

1876. If it is necessary to designate objectives to a person at a distance, it is important to remember that objects often present very different appearances if viewed from widely separated positions. This also applies to panoramic sketches. If a courier is used to transmit such information, he is required to keep the objective in view as much as possible while passing from one station to the other.

1877. The designation of objectives may be greatly facilitated by the use of maps or by causing a position or place sketch of the terrain to be prepared and copies to be furnished the different subordinate commanders concerned. On such a sketch important landmarks and military objectives should be named or numbered for ready reference, or the map may be ruled into squares each being appropriately designated.

Sec. II.—PREPARATION OF FIRE.

1878. The fire control officer is normally the company commander; or the senior company commander where the guns of more than one artillery company are grouped for purposes of fire control, and as such may also be designated as battery commander. He is charged with the preparation of firing data, called the **preparation of fire.**

1879. The **firing data** embrace all the information and commands necessary to enable the gun squads to accomplish the orderly, rapid, and accurate service of the pieces.

1880. The complete firing data are always necessary before firing the first salvo or volley after occupying a position. After the first salvo or volley the fire control officer announces only so much of the data as he desires to change.

1881. The necessary data for **indirect laying** in their habitual sequence are:

1. The designation of the aiming point.
2. The deflection.
3. The deflection difference.
4. The site.
5. The kind of projectile (corrector or percussion shrapnel).
6. The range.
7. The method of fire.
8. The command, **fire.**

1882. The necessary data for **direct laying** in their habitual sequence are:

1. Te designation of the target.
2. The deflection.
3. The kind of projectile (corrector or percussion).
4. The range.
5. The method of fire.
6. The command, **fire.**

Sec. III.—THE DETERMINATION OF FIRING DATA.

The Target or Aiming Point.

1883. Where direct fire is to be employed, the target will usually be in such plain sight from the guns that its designation involves no difficulty. The command for **direct fire** is **TARGET—THAT BLOCK HOUSE** (or as the case may be).

Where **indirect fire** is to be used, the command is **AIMING POINT—THAT WINDMILL** (or as the case may be).

1884. The selection of aiming points calls for special attention. The best aiming points are:

1. Continuously visible through the panoramic sight of each gun.
2. Easily designated and identified.
3. Of narrow width and sharp definition.
4. At a considerable distance from the guns.
5. Near the normal to the line of guns, or near the line of the guns prolonged.

It will frequently be impracticable to select an aiming point fulfilling all these conditions.

1885. The use of the same aiming point by all of the guns of a fire unit simplifies conduct of fire.

Some object which quickly attracts the eye should be selected, and, if possible, it should be the only object of its kind in the vicinity so that mistakes may not arise either in the designation of the aiming point or in finding it quickly after looking away.

Narrowness and sharp definition in an aiming point make uniformity of laying more certain. If a broad aiming point must be chosen, the part of it to be used must be designated. If a tree, its trunk may be designated; if a ledge of rock, a certain edge; if a building, a certain chimney, peak, or gable.

1886. Although refinements in calculation of parallax (see "Deflection difference," Arts. 1904 and 1905) are uncalled for, aiming points should be chosen to reduce calculations. If the object is distant, the parallax corrections will be small; usually objects more than 2,000 yards distant are best. If the object is directly behind or ahead of the guns, the parallax need not be corrected for obliquity; if on the flank, the parallax is zero.

1887. A point in rear of the guns is preferable to one in front, because the top shield does not interfere with vision.

A point on a flank is appropriate when at a greater distance than 1,000 yards and when enough to the rear to prevent its being obscured by any of the matériel or personnel. At shorter distances the recoil of the gun carriages materially changes the parallax, thus shifting the sheaf of fire and causing irregularities of distribution.

1888. When artificial aiming points must be established near the guns, the best direction for a common one is directly in rear of the center of the line of guns. To reduce the effect of recoil upon parallax a separate one may be placed directly in rear of each gun.

1889. If the distant aiming point is apt to be obscured by mist or smoke, then provision must be made for a secondary aiming point. The guns having been oriented on the target by means of the distant aiming point, the sights may, when necessary, be turned upon the new aiming point and the latter used in subsequent fire.

Deflection.

1890. In **direct fire**, the only corrections are for drift of projectile, effect of wind on projectile, and motion of the target. Their amount is small.

The correction for drift is always additive; that for wind may be either additive or subtractive, depending upon the direction of the wind. The value of each correction is first estimated; they are then combined to secure the resultant correction.

The following rough rules may be of assistance:

1. To overcome drift increase the deflection by 3 mils for ranges up to 3,500 yards; by 5 mils for longer ranges.
2. To overcome a 10-mile cross wind change the deflection in the appropriate sense by an amount in mils equal to the number of even thousands of yards in the range.

1891. The travel of a target during the flight of a projectile is corrected as follows:

If the line of travel of the target makes an angle greater than 45° with the line of fire, take 5 mils deflection if the target is moving at a walk; 10 mils, if moving at a trot; 15 mils, if moving at a gallop. If the line of travel makes an angle less than 45° and greater than 15°, take one-half of the foregoing deflections. For angles less than 15° make no correction.

If the target is moving to the left, add the correction; if to the right, subtract it.

1892. For **indirect fire** there must be determined the deflection setting which will cause each piece to be directed upon its target when its line of sight is directed upon its aiming point. In unfavorable country this may sometimes require considerable ingenuity. The method usually employed is to select a common aiming point and to determine the deflection which will cause one of the pieces (the directing piece) to be pointed in the required direction. The corrections for wind, drift, and movement of the target are then applied with the proper sign if conditions render such refinements advisable. A correction is also determined which, applied in arithmetical progression to the deflection of the directing piece, will give for each of the other pieces the deflection necessary to bring its line of fire in the appropriate direction.

The command for designating the deflection is: **DEFLECTION (SO AND SO).**

Graduation of the Deflection Scale.

1893. Both the panoramic sight, and the battery commander's telescope, have the horizontal graduations in **mils.** There are 6,400 mils in a circle, and an angle of one mil has a natural tangent of $\frac{1}{1000}$ (approximately). In other words, if an object has an angular width of 1 mil, it is 1 yard wide, if 1,000 yards distant; 2 yards wide, if 2,000; 3 yards wide, if 3,000; and so on.

The battery commander's telescope is graduated in **counterclockwise** direction, 0-6400; the panoramic sight in **clockwise** direction, 0-6400. The zero of the panoramic sight scale is pointed toward the target, its direction being parallel to the axis of the gun. The zero of the battery commander's telescope is directed at the **aiming point.**

1894. If the battery commander's telescope is set at zero and clamped to the scale, and the scale is unclamped from the stand, the telescope and scale may be revolved, pointed at the aiming point, the scale there clamped and telescope unclamped. The telescope may now be directed at the desired target, and the deflection read, say 2,400. If now the panoramic sight be set at the same deflection, 2,400, and if gun and sight be swung until the sight is on the aiming point, the gun will be pointed on the target (see Fig. 160). The above holds exactly where the panoramic sight and battery commander's telescope are located in the same vertical line. If as is usually the case, the battery commander's telescope is at an observing station more or less distant from the gun, the observed deflection must be corrected for use at the gun as described below.

Correction of the Deflection.

1895. The angle between the aiming point and target, at the observing station, must be corrected by (1) the offset from the target, and (2) the offset from the aiming point (see Fig. 161).

The offset from the aiming point is the perpendicular distance from the observing station to the **gun-aiming point** line or line prolonged, reduced to **mils** by dividing by $\frac{1}{1000}$ of the distance to the aiming point.

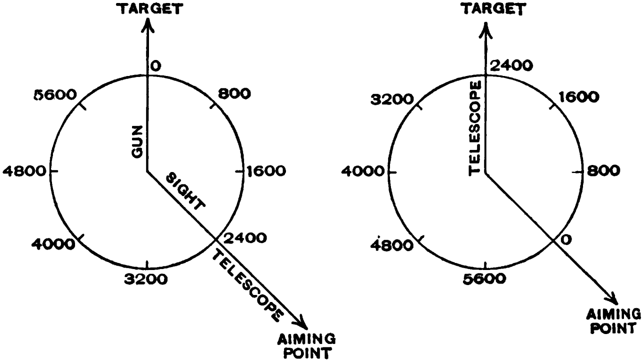

FIG. 160.

The offset from the target is the perpendicular distance from the observing station to the **gun-target** line or line prolonged, reduced to **mils** by dividing by $\frac{1}{1000}$ of the distance to the target.

These corrections are sometimes added to the measured deflection, and sometimes subtracted, depending on the relative positions of observing station and aiming point with reference to the gun and target.

1896. The offset from the **aiming point** depends (1) on whether the observing station is on the right flank or left flank of the gun; (2) on whether the aiming point is in front, or in rear, of the line from observing station to gun.

The offset from the **target** depends only on the first of the above two conditions.

The rules follow:

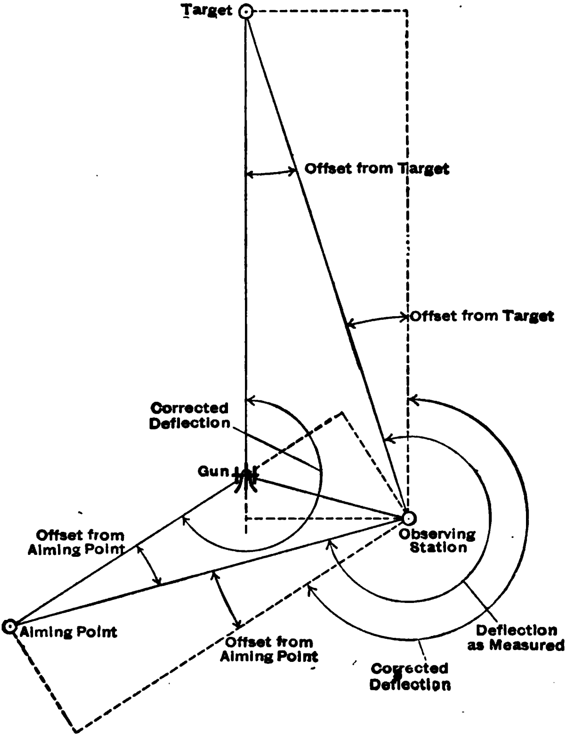

FIG. 161.

I. Aiming point to the rear.

Observing station on **right flank**, **subtract** both offsets; observing **station on left flank**, **add** both offsets.

1905. Parallax of the aiming point is the angle subtended, at the aiming point, by the distance between two adjacent guns of the battery. It has its maximum value when the aiming point is directly in front or rear of the line of pieces.

Parallax of the target is the angle subtended, at the target, by the distance between two adjacent guns. As the target is usually directly in front of the line of piece, its parallax is is generally a maximum.

Where the aiming point or target are not directly behind or in front of the line of pieces, the distance used is not the full distance, but the distance measured in a direction perpendicular to the line of aiming point or target, respectively.

1906. The rules follow:

I. **Parallel fire. Close** by the parallax of the aiming point, if aiming point is in **rear,** and **open** by **parallax** of aiming point, if aiming point is in **front.**

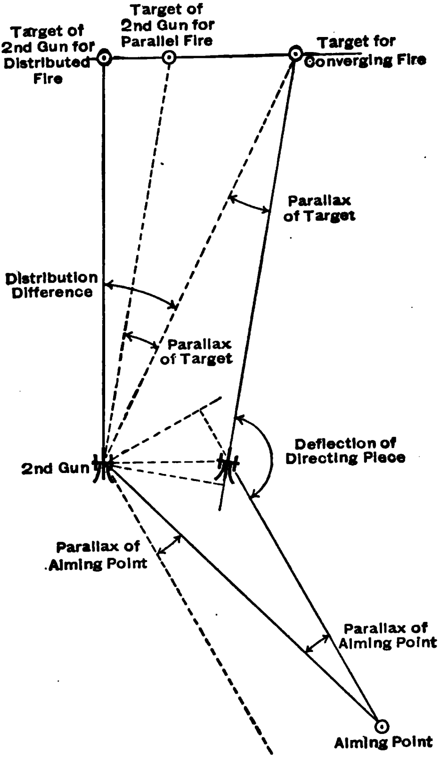
Target of 2nd Gun for Distributed Fire
Target of 2nd Gun for Parallel Fire
Target for Converging Fire
Parallax of Target
Distribution Difference
Parallax of Target
Deflection of Directing Piece
2nd Gun
Parallax of Aiming Point
Parallax of Aiming Point
Aiming Point

Fig. 162.

II. **Converging fire.** (1) **Close** by the parallax of the aiming point, if aiming point is in **rear,** and **open** by **parallax** of aiming point, if aiming point is in **front;**

(2) then **close** by parallax of target.

III. **Distributed fire.** (1) **Close** by the parallax of aiming point, if aiming point is in **rear**, and **open** by parallax of aiming point, if aiming point is in **front**.

(2) close by parallax of target;

(3) then **open** by an amount equal to the front of target to be covered, in mils, **divided by one less** than the number of guns in the battery (see also Art. 2019 "Distribution of fire for effect.")

These rules are based on the supposition that the guns are (1) brought **parallel**; (2) then **converged**; (3) then **distributed** over the desired front; and (4) that the **directing piece** is given the deflection necessary to enable it to **hit its proper part of the target.**

1907. Unless time is taken to compute firing data very accurately, the deflection difference is usually given to the nearest multiple of 5.

The command is: **ON FIRST (OR OTHER) PIECE—OPEN (CLOSE) (SO MUCH).** If the command is **open**, pieces on the **left** of the directing piece increase the deflection by as many times the deflection difference as the gun is intervals away from the directing piece; if on the **right**, they similarly decrease it. If the command is **close**, the reverse applies.

For subsequent firings, to change the distribution, the order is: **ON (SUCH) PIECE, OPEN (CLOSE) (SO MUCH)**, and the deflection of each piece is changed, in the direction indicated by the designated amount (times the number of intervals it is away from the new directing piece); that is, the correction is applied directly to the deflection reading for the gun itself, not the possibly different one of the directing piece, or the direction of a single piece may be changed by the order: **SECOND (OR OTHER) PIECE, RIGHT (LEFT) (SO MUCH).**

The Site.

1908. The site (angle of site or position angle) is measured in mils, in the vertical plane, the horizontal being represented by **300.** If the target is 10 mils higher than the gun, the site is 310; if 10 mils lower than the gun, 290.

If the target is visible from the position of the guns, the site may be measured there. If not visible from the guns, the site may be measured at the observing station and transformed for use at the guns.

In open country the site may often be estimated with sufficient accuracy by referring the site of the target to a distant horizon, the site of which is ordinarily 300.

1909. If the observing station is near the guns, but at a different level, the angle measured at the observing station is corrected as follows: Estimate the difference of level in yards between observing station and guns; convert this difference into mils by dividing by $\frac{1}{1000}$ of the range to target, and apply the result with the proper sign as a correction to the site of the target as measured at the observing station.

Example:

Site measured at observing station.................	=	320 mils.
Estimated height of observing station above guns...	=	30 yards.
Range of target (measured or estimated)...........	=	3, 300 yards.

$$\text{Correction} = + \frac{30}{3} = + 10 \text{ mils.}$$

Site at guns = 320 + 10 = 330 mils.

1910. If the distance from observing station to target differs materially from that of gun to the target, proceed as follows:

(1) Measure the site of the target in mils, **multiply** the amount the site differs from 300 by $\frac{1}{1000}$ of the distance to target, in yards; the result is the height of the target above or below **observing station**, in yards.

(2) Similarly estimate or compute the height of the **guns** above or below the observing station, in yards. This value added or substracted from the preceding value, gives the height of the **target** above or below the guns, in yards.

(3) Convert this to mils, by **dividing** by $\frac{1}{1000}$ of the range from gun to target, in yards. If target is **higher** than the guns, **add** to 300; if **lower, substract.**

The command is given: **SITE (SO MUCH)**. It is usually given to the nearest multiple of 5.

The Kind of Projectile.

1911. Projectiles may be of the following types: (1) High explosive shell; (2) High-explosive shrapnel; (3) Common shrapnel. Of these, only the common shrapnel is used in the U. S. Navy. This is fitted with several different types of fuses, namely: Bethlehem 12-second, F. A. 15-second, and F. A. 21-second. The method of setting these fuses differs somewhat, according to the type. All three are combination fuses. The Frankford Arsenal (F. A.) 21-second combination, having been ordered for future shrapnel, is the one principally referred to in this section. It has a hand fuse setter which simplifies the setting of the fuse. For other types certain modifications are necessary.

1912. With reference to the setting of the fuse, fire may be **time fire**, where the projectile bursts after a given time; or **percussion fire**, where it bursts only on impact.

1913. For convenience, the **hand fuse setter** for setting the time fuse is graduated in range. But, due to errors of the fuse and other causes, the base charge will not always explode at exactly the range set off. Moreover, it is sometimes necessary to vary the height of burst. For this the fuse setter is arranged to permit changing the fuse setting without changing the range reading on the fuse setter. The device for accomplishing this is called **the corrector** and consists of an auxiliary scale, graduated from 0 to 60. A corrector of 30 ordinarily gives a height of burst of about 3 mils as seen from the guns. This height of burst is called **normal**. Raising the corrector **shortens** the time train and therefore **raises** the height of burst.

Each division of the corrector scale changes the height of burst about 1 mil, which brings the point of burst about 20 yards nearer or farther from the firing gun. Thus for a setting of corrector 35, at any range, the burst should appear about 5 + 3 = 8 mils above, and about 8 × 20 = 160 yards short of the target. (These values are only an approximation.)

The command for time fire is: **CORRECTOR 30 (OR SO MUCH).**

1914. Where no hand fuse setter is supplied, it is necessary to refer to some auxiliary table (sometimes this is graduated on the sight bar) giving the time of flight corresponding to the range of target. A **range-time of flight** table (abbreviated from the range table) facilitates setting the fuse under these conditions.

1915. For **percussion fire**, the fuse is set at "safety." This automatically sets it to burst on impact. The command is: **PERCUSSION.**

1916. To change corrector setting the command is: **CORRECTOR UP (DOWN) (SO MUCH).** For instance, if the corrector is already at 35, and the command is **up 3**, the new setting is 38.

The Range.

1917. The initial range may be determined by means of a range-finding instrument, by angle-measuring instruments and a measured base, by the use of maps, by sound, by estimation, from auxiliary observers, from previous fire, or from other units. It should be as accurately determined as circumstances permit, since its correct predetermination is essential to promptness of effect.

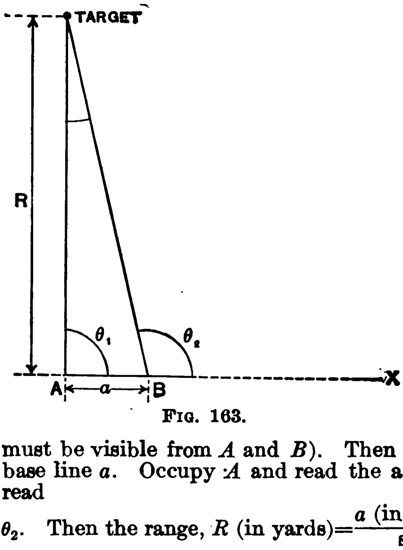

FIG. 163.

If the objective is indistinct, or if the air is calm or gently blowing from the range toward the observer, so that the smoke of bursts is likely to obscure the target for an appreciable time, the first range used should be somewhat long.

If fire over friendly troops near the target becomes necessary, the first range used should be surely long.

1918. To measure the range, perhaps the easiest method is as follows: Select an aiming point X, whose bearing is as nearly 90° as practicable from the target. Post men, or drive stakes at A (position of observer) and B, so that A, B, and X are in the same straight line. (Target and aiming point must be visible from A and B). Then measure AB, which is the base line a. Occupy A and read the angle θ_1, then occupy B and read θ_2. Then the range, R (in yards)$=\dfrac{a \text{ (in yards)} \times \sin\theta_2}{\sin(\theta_2-\theta_1)}$. This may readily be computed if trigonometric tables or the slide rule are available; the equation holds true whether θ_1 is a right angle or not.

But if θ_1 and θ_2 are between (say) 80° and 100°, and if the angles are measured in **mils**, then the following equation, readily computed without tables, may be used:

$$\text{Range (in yards)}=\frac{a \text{ (in yards)} \times 1000}{(\theta_2-\theta_1) \text{ (in mils)}}.$$

1919. To transmit the range the command is given: **RANGE 3250 (OR SO MUCH).**

Sec. IV.—THE METHOD OF FIRE.

1920. The methods of fire are (1) by single (designated) piece; (2) by salvo; (3) volley fire; (4) continuous fire; (5) fire at will.

(1) **By single piece.** The designated piece only, loads and fires. The command is: **FIRST (OR OTHER) PIECE ONLY.**

(2) **By salvo.** A battery salvo is a single round from each gun of the battery, fired in succession, commencing with the designated flank. The interval between shots, unless otherwise directed, is about two seconds. The command is:

BATTERY IN SUCCESSION FROM THE RIGHT (LEFT); or to fire a salvo from two guns: **THIRD AND FOURTH (OR OTHER) PIECES, IN SUCCESSION FROM THE RIGHT (LEFT).**

The flank to leeward should always be designated to fire first, as the bursts can be better observed.

(3) **Volley fire.** This consists in each piece, independently of the others, firing the designated number of rounds as rapidly as possible, **consistent with accuracy.** The command is: **BATTERY, THREE (OR SO MANY) ROUNDS.**

(4) **Continuous fire.** Each piece fires continuously, at designated intervals, the interval will be short or long, as ordered.

The command is: **BATTERY, CONTINUOUS FIRE, RAPID (OR AT SO MANY SECONDS INTERVAL).** "Drum" fire and "barrage" fire are in this class.

(5) **Fire at will.** This is used solely for the close defense of the guns. Fire is opened when directed, refinements of laying are neglected, and the effort made to establish a fire swept zone through which the enemy must advance.

1921. The command is **FIRE**, **for a single piece, or a battery salvo; COMMENCE FIRING for volley fire, continuous fire and fire at will.** the command is given by the fire control officer, and if he is at some distance, it is repeated by the senior pt. c., when all guns are ready. For a battery salvo the command is given only once, and refers to all guns, which then fire in succession. The pointer gives the order **FIRE** for his individual piece.

Sec. V.—SUMMARY.

1922. The following is a summary of the foregoing rules for indirect fire:

(1) Select an observing station from which a good view of the target and its surroundings may be obtained, as close to the guns as

conditions permit, and as nearly as possible on prolongation of their front.

(2) Select an aiming point which is surely visible from all the guns, preferably directly in rear, and at least 2,000 yards away.

(3) Measure or estimate the perpendicular distance from observing station to gun-aiming point line, and calculate the aiming point offset; also the perpendicular distance to gun-target line, and calculate the offset from the target. Measure the angle from aiming point to target, apply offsets, and get the deflection of the directing piece.

(4) Measure or estimate the distance between guns, measured normal to gun-aiming point line, and calculate the parallax of aiming point; also the distance measured normal to gun-target line, and calculate the parallax of target. Measure the front of target to be covered, in mils, and calculate the distribution difference. From these, calculate the deflection difference.

(5) Measure the site of target, and correct, if necessary, for any difference of level between observing station and guns.

(6) Measure the range, using the best means available.

1923. Example: An artillery company is ordered to take a masked position and open fire upon a body of infantry about **3,000** yards away.

The c. c. finds an observing station **200** yards to the **left** of the **right** piece, and a little in advance of the battery front. He selects an aiming point in rear, **5,000** yards away.

He estimates the perpendicular distance to gun-aiming point line to be **175** yards, and calculates offset from aiming point $\frac{175}{5}=35$ mils.

He estimates distance to gun-target line as **200** yards, and calculates offset from target $=\frac{200}{3}=67$ mils. He measures angle from aiming point to target, 2,532 mils. Then **deflection of directing piece** $= 2{,}532+35+67 =$ **2,634**. He estimates distance between guns, measured normal to gun-aiming point line as **17** yards; normal to gun-target line as **20** yards. He has (say) four guns in his company, and the measured front of target is 50 mils. He calculates: parallax of aimimg point$=\frac{17}{5}=3$; parallax of target $=\frac{20}{3}=7$; distribution difference $=\frac{50}{4-1}=17$; and **deflection difference**, close by 3, close by 7, open by 17 = **open by 7** (algebraic sum).

He measures the site **292**, and estimates that the guns are 7 yards lower than observing station. He calculates $300 - 292 = 8$; $8\times\frac{3000}{1000}=24$; $24-7=17$ yards; $\frac{17\times1000}{3000}=6$; $300-6=294$; therefore the site is **294** (corrected).

He measures the range with a range finder, **3150**.

He commands:

1. **Aiming point, that lone tree.**
2. **Deflection 2630** (nearest multiple of 10).
3. **On first piece, open by 5** (nearest multiple of 5).
4. **Site 295** (nearest multiple of 5).
5. **Corrector 28.**
6. **Range 3,150.**
7. **Battery, in succession from the right.**
8. **FIRE.**

The fire control officer observes this salvo and estimates the **direction** of the third piece as correct, the **distribution** as somewhat too large, the **height of burst** as high (all four burst in air mean height 9 mils), and the **range** as indeterminate (on account of the high bursts).

He commands:

1. **On third piece close 5.**
2. **Corrector down 10.**
3. **Battery, in succession from the right.**
4. **FIRE.**

and fires such other salvos as may be necessary to effect the adjustment.

Having fired upon the target of the previous example until it disappears at 4,000 yards, the battery commander sees another body of troops whose range he estimates as 2,000 yards. Using the ruler, he finds that his target is 300 mils to the right of the last target and that its site is 295.

Treating the old target as an **aiming point** (and remembering that observing station is on left flank, 200 yards from gun-target line) he computes deflection$=-300-\frac{200}{4}+\frac{200}{2}=-250$

He commands:

1. **Right, 250.**
2. **Site, 295.**
3. **Corrector, 20.**
4. **Range, 2000.**
5. **Battery, in succession from the right.**
6. **FIRE.**

make it impossible to utilize a common aiming point or to see one piece from another.

Solution.—The fire control officer causes the pieces to be pointed by the compass or other means, as nearly as may be in the proper direction. One of the pieces is selected to fire a single round of time shrapnel so as to give a burst about 10 mils above the horizon visible from the guns and at as great a range as practicable. The remaining pieces are so elevated and the sights are so set as to enable each pointer quickly to turn the rotating head of his panoramic sight upon the burst without disturbing the laying of the piece. Each gun captain, having noted the deflection, causes the pointer to turn the sight on any suitable aiming point without disturbing the laying. The reading on the aiming point selected is then diminished by the reading on the burst if this latter reading was less than 3,200. If the reading on the burst was greater than 3,200 the reading on the selected aiming point is increased by the difference between the burst setting and 6,400. The deflection obtained by making the corrections just indicated is then set off on each sight and each pointer brings his cross hairs on the aiming point selected, by traversing the piece. This results in the pieces all being laid on the point of burst of the shot fired.

Measurement of Angles.

1926. Angles may be measured in mils by means of the telescope, the sextant telemeter, the ruler, the scale in the field glass or its known field of view, or by handbreadths.

The telescope and the sextant telemeter[1] are instruments of precision. The graduated field glass affords means of measuring angles accurately. When neither the telescope nor sextant telemeter is available, or when time does not admit of their being set up, use may be made of the less reliable means, practice with which will insure considerable accuracy.

1927. As the ruler[1] is already graduated, the distance at which it should be held from the eye so that its graduations will cover corresponding spaces on the scales must be determined by trial. Usually this distance is then fixed by tying the ruler cord to the clothing or by knotting it and holding the knot in the teeth.

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[1] For method of using and adjustment, see Bureau of Ordnance pamphlet, "Hand book of 3-inch Field and Landing Guns and their Ammunition."

When the hand is used for angular measurements, its distance from the eye should be such as may be assumed naturally and uniformly and maintained without fatigue. The portions of the scales then covered by different parts of the hand can be determined and memorized.

Average values are given below, it being presumed that the hand is held vertically, palm outward, arm fully extended to the front:

	Mils.
Width of first finger at second joint	40
Width of second finger at second joint	40
Width of third finger at second joint	35
Width of little finger at second joint	30
Width of first, second, and third fingers at second joint	115
Width of first, second, third, and little fingers at second joint	150
Width of thumb	40

The width of the field of view of the field glass can be determined similarly and quite accurately divided by eye into halves, quarters, and eighths.

In making the above calibrations the operator must stand at the position of the instrument used in establishing the scales.

1928. Errors of measurement and calculation and the time required increase with the angles, particularly if the rougher methods are used. It is important, therefore, to reduce large angles as much as possible by resort to various expedients.

For example, an assistant may sight across the face of the object glasses of the field glass upon the aiming point or target. The observer may then select an auxiliary point on a right line perpendicular to the line to the aiming point or target. An angle that must be measured may thus be reduced by as much as 1,600 mils.

Firing Over a Mask.

1929. When a position for masked fire is to be occupied, it is necessary to make sure that the projectiles from each gun will clear the mask and reach ground which is occupied or is expected to be occupied by the enemy. Any space within range, which can not be so reached, is called **dead space.**

1930. If the guns are already in position **and the mask is not more than 200 yards in front,** the guns may be given the elevation and site corresponding to the nearest expected position of the enemy, and a glance through the bores will tell whether the projectiles will clear the mask. At greater distances, or if any doubt exists, lay the gun as before; then set the sight at the range to the highest part of the mask and glance through the sights. If the line of sight clears the mask, the projectiles will clear it also.

1931. Frequently it is necessary to determine whether or not the guns will clear the mask, before they arrive. In such cases it is necessary to decide what are the shortest range and lowest site which will be used. The height of the trajectory at the distance of the mask is then determined and compared with the height of the mask.

1932. If the battery commander's rule is available, the height of the trajectory in mils may be calculated for any given range and distance to the mask. (See Bureau of Ordnance Pamphlet, "three-inch Field and Landing Guns and their Ammunition.")

If this is not available, there are several approximate methods which may be used.

(1) The angles of elevation of the 3-inch field and landing guns are:

Range to target in yards.	3-inch field gun, M. V. 1,150 F. S.	3-inch landing gun, M. V. 1,650 F. S.
	Mils.	*Mils.*
1,000	40	23
2,000	90	57
3,000	150	100
4,000	225	160
5,000	....	230

These angles may readily be memorized for a given gun. If the site of the crest observed by a man kneeling at the gun position, measured by handbreadths is less than the elevation for the range, the projectile will clear the mask, if the mask is close at hand. If farther away, the necessary clearance may be given by subtracting about 5 mils from the elevation, for each 100 yards the crest is distant from the guns. In using this method the site of target must also be considered, by subtracting from the elevation the amount the site is less than 300, or adding the excess over 300.

(2) When the position considered is on the reverse slope the possible positions in which the guns may be placed may be determined as follows: The observer, dismounted, places himself so that the tar-

get or terrain on which the target is expected is just visible over the covering crest. If the distance of the observer to the crest is 40 yards (landing gun) or 25 yards (field gun), or over, the guns may be placed anywhere on the reverse slope so long as this slope remains approximately regular and yet be able to clear the crest at ranges of 2,000 yards and over.

This method rests on the assumption that the height of the eye of a man is about 2 yards above the ground. Since the observer is so placed that the line from his eye to the target is tangent to the crest, the slope, when he is 40 yards from the crest, is 1 in 20. A slope of 1 in 20 is equivalent to an angle of 50 mils, which corresponds to a range of 2,000 yards for the landing gun.

If the observer is mounted, the distances are **60** and **40** yards, respectively.

(3) When mountains are visible in the direction of the targets, or when certain cloud conditions exist with sufficient stability, it is sometimes possible to locate a point at a height above the target equal, or nearly so, to the elevation corresponding to the range. When this is possible the position of the guns giving the maximum defilade may readily be determined as follows: From the covering crest select the nearest target, or point, on which fire is to be delivered. With the hand lay off above the target the corresponding elevation and locate the resulting point. Moving down the reverse slope the guns can be placed anywhere so long as this auxiliary point is visible by a man kneeling. For example, from the covering crest the observer locates the nearest target and estimates its range as 2,000, for which the elevation is 50 mils. Laying off a vertical angle of 50 mils from the target he locates a certain natural feature. He then goes down the reverse slope until this feature is just visible above the covering crest. This position is that giving the maximum possible defilade. If the resulting position is several hundred yards away from the crest, allowance must be made for the drop of the trajectory from the line of departure. Ten mils, for example, may readily be allowed by determining the position from which the located point will appear at that angle above the covering crest.

(4) Whatever the method by which determined, the fact that the guns will clear the mask should be verified after the guns arrive, by glancing through the bores.

Sec. VII.—CONDUCT OF FIRE.

General Provisions.

1933. To render effective assistance upon the battle field, artillery must be able to deliver a timely and overpowering fire upon any designated part of the enemy's position.

1934. Those areas of the hostile position within which fire is to be delivered by particular artillery units are called **sectors.** They are usually described by reference to prominent points of the terrain. Within, and sometimes outside, the sectors assigned, fire must be delivered upon objectives called **targets.**

1935. The officer charged with the conduct of fire must be the master of the fire of his guns. He must be able to turn the fire promptly upon any target at will and to regulate its intensity and distribution as circumstances require. The attainment of this condition requires on the part of the officer complete familiarity with the weapons at his disposal and skill and quick decision in their use, and on the part of the organization thorough knowledge of the matériel, uniform and reliable service of the piece, cooperation of all parts, and strict fire discipline.

1936. Owing to inaccuracies in the determination of firing data, to the influence of weather conditions, to errors made in the service of the guns, and to imperfections in matériel and ammunition, fire must be delivered and, on the basis of observations, corrected to insure effectiveness upon the target. Fire of this nature is called **fire for adjustment.** During such fire effect is desirable.

When fire has been thus adjusted, it must be continued, often with changed data, to secure effect. During such fire continued observation is necessary. Fire of this nature is called **fire for effect.** In addition to physical effect, artillery may produce important effects of **neutralization, moral support,** or **diversion.** These will be the more surely obtained if accompanied by great physical effect, but they may be obtained though physical effect is slight. These effects are to be considered in the decision to start or stop the fire or to vary its intensity.

1937. For adjustment of fire, a knowledge of how to manipulate the trajectory, combined with accurate observation, or "spotting," are essential. These will be taken up in turn, after which the details of adjustment will be considered, alone and in relation to the different classes of targets.

Manipulation of the Trajectory in the Plane of Fire.

1938. The location of the trajectory in the vertical plane depends upon the site and the elevation. It may be changed by changing one or the other of these elements, or the same location may be retained by making the proper changes of both in opposite senses.

A variation of the site affects the range the same as an equal variation of the elevation.

The height of burst under normal conditions depends only on the site and the corrector.

If the site only is varied, the point of burst is displaced in height, but not in range; if the corrector only is varied, the point of burst is displaced at the same time in both height and range. Simultaneous and equal but opposite changes of site and corrector cause no change in height of burst, but the burst range changes.

The burst range depends only on the fuse setter range and corrector settings. It is increased or diminished by increasing or diminishing the fuse setter range or by lowering or raising the corrector.

The points of burst of two or more rounds are not coincident unless these three elements remain constant, or unless all three change at the same time by suitable amounts and in the proper relation.

Sec. VIII.—NOTES ON "SPOTTING" OR OBSERVATION OF FIRE.

1939. The point of burst or impact is determined partly by the characteristic appearance of the smoke of the bursting charge, partly by its location relative to the target and partly by physical effect on the target or terrain.

"Spotting" Bursts in Air.

1940. A burst in air produces a ball of smoke which ordinarily remains together for an appreciable time, and the smoke, white or light gray in appearance, is projected in the direction of the trajectory. The point of burst is therefore always above the center of the smoke ball. At ranges beyond about 2,000 yards the point of burst is near to or above the summit of the smoke ball, and the latter, observed from near the plane of fire, is seen in a pear-shaped form, small end uppermost.

1941. An air burst after ricochet gives a pear-shaped smoke ball, with the broader end up.

Occasionally a burst in air close to the ground will give a flattened smoke ball discolored by dust or mud in considerable quantity, caused by the impact of a large number of bullets on a small area.

"Spotting" Bursts on Impact.

1942. When a common shrapnel bursts on impact, the smoke ball is discolored and fugitive, its upper portion wide and irregular but somewhat flat.

1943. When a shell or high-explosive shrapnel bursts on impact, a large irregular columnar mass of black smoke and dirt is formed, which remains visible for some time.

1944. The bullets and fragments from a burst in air knock up a considerable amount of dirt and dust if they strike dry soil; on wet soil splashes of mud are knocked up by the shrapnel case and large fragments. Occasionally the effect of bullets and fragments may be observed in the flattening of long grass or in the movement of brush or tree branches.

1945. An air burst of high-explosive shrapnel is followed by a percussion burst of the head. Care should be taken to distinguish the impact burst of the head from a graze burst of the whole projectile.

"Spotting" for Height of Burst.

1946. The height of a burst is measured or estimated from the bottom of the target to the point of burst if the target is not concealed in trenches or behind a crest; otherwise it is measured from the summit of the covering crest.

1947. The height of a group of bursts is the mean of the individual heights of burst.

"Spotting" for Range.

1948. It is rarely possible from a position near the guns to estimate with accuracy the amount of the error in range. Such estimates are usually too small and cause delay through an effort to correct the fire by making timid and insufficient changes in the range.

Attention should rather be concentrated on deciding, from careful observation of each shot, upon the sense of a number of shots fired with the same range and site, and on quickly inclosing the target with fire which is surely short and fire which is surely over.

If the sense of a shot can not be definitely decided upon, it is doubtful, and should be disregarded.

1949. The most accurate sensing of range is based on observation of effect on the target. Next comes observation of bursts on impact, then of effect on terrain, then of the position of the smoke ball with respect to the target.

1950. If the observer is considerably above the target, or the target is on ground sloping toward the observer, the sense of a salvo (**short** or **over**) may usually be recognized readily by noting the relative position, with respect to the target, of graze bursts of the projectile.

1951. If the outlines of the target are more clearly defined against the smoke of the burst, the range may always be considered as **over**, whether the burst occurred in air or on graze.

1952. If the target is obscured by the smoke of the burst, the range may be considered as **short**; but, in the case of a burst in air, the burst must be **low** in order to warrant this conclusion.

1953. If the target is indistinct and of about the same color as the smoke, it may be less visible against the smoke as a background. A burst beyond the target may, for this reason, sometimes seem to obscure the target, and hence be judged **short**, when it is in reality over. On the other hand, some targets become very much more visible if projected against a smoke background.

1954. Frequently the target occupies terrain of such a nature as to justify sensings of rounds, when the deflection is known to be approximately correct, as **lost over**. But soft or swampy ground may completely smother a burst and prevent sensing.

1955. If the wind is blowing **up** or **down** the range, a decision should be formed quickly as to the relative position of the smoke with respect to the target. But if the wind is blowing **across** the range, it may be better to wait until the smoke has drifted across the front or rear of the target. To secure this result it may be desirable to direct the fire at the windward flank of the target.

1956. In observing bursts with reference to a crest, care must be taken not to be deceived by a crest parallel to the crest sought, but short of it. In rolling country such an intermediate crest is often present, and it may merge into the background formed by the higher ground in its rear, and hence escape detection, while, as a matter of fact, there may be a broad valley or depression between the two crests. Shots observed against the near side of the intermediate crest are short and easily sensed, but shots which pass over the intermediate crest and burst low or on graze in the valley between the two and are lost, may be thought to have cleared the farther crest and erroneously sensed as over. Such deceptions may be avoided by obtaining bursts in air on the line joining the observer and the crest sought. If the ball of smoke is cut in two by the crest and the crest clearly defined against it, the burst is **over.** If the crest is concealed by the smoke, the burst is **short.** The short burst may often serve to reveal the existence of the intermediate crest by causing the latter to be silhouetted against the smoke.

1957. When the burst is in the direction of a wood the smoke ball may present a ragged appearance due to its being partly hidden by branches or foliage. The indication is that the burst is beyond the near limit of the wood.

1958. If the sun is shining, information as to the sense of burst in air may often be obtained by observing the shadow of the smoke ball on the ground. The height of the burst and the position of the sun must, however, be taken into consideration.

1959. Observations of range from lateral positions are complicated by errors of direction. But if the direction is correct all shots seen by the flank observer will be over if they appear beyond the target, and short if on the near side.

1960. An accurate conception of the terrain in the vicinity of the target increases the number of rounds which may properly be called sensible. Preparatory to opening fire the study of ground forms around the hostile positions should be taken up, and this should be continued during the action.

Auxiliary Observing Stations.

1961. Auxiliary observers may frequently be used with advantage at stations near the targets or at a considerable distance to a flank of the line of fire. Elevated stations are particularly favorable. In the selection of such stations the most important requirements are a plain view of the target and its adjoining area, cover from hostile discovery, and sure and swift communication with the stations to which they are auxiliary.

1962. With respect to the adjustment of fire, they indicate especially whether the range is **short, over,** or **correct;** whether the **burst interval,** when in front of the target, is too **great,** too **small,** or **correct;** whether the direction is **right, left,** or **correct.**

If large errors in range are made, an observer on the flank of the guns will not usually be able to separate the errors in range from those in direction; in such a case the observer would ordinarily signal the direction only, as right or left, as it appears to him, and the officer conducting the fire, knowing the position of the observer, would deduce the sense of the salvo, volley, etc., in range.

1963. With respect to movements of the enemy, the observer reports especially: If the enemy abandons his position; if he shifts to the right or left, front, or rear to escape effective fire; whether hostile reenforcements enter the sector and their location.

1964. With respect to our own troops, the observer makes such reports as to their movements and situation as will enable the artillery commander best to assist them with the fire of the guns.

1965. Arrangements should, moreover, be made to obtain from advanced troops information which will assist in the adjustment of fire, and indication as to when fire should be commenced or discontinued.

1966. Auxiliary observing stations are sometimes established in captive balloons or mobile aircraft, and are of great assistance in the study of terrain and the location of targets, or in "spotting."

The designation of objectives is difficult. It is possible, however, by several methods, such as by photography, by sketches, by reference to squared maps, by description, or by their relation to reference points.

1967. In observation of fire from a great height, bursts in air and bursts on graze may both be seen, but it is difficult to judge the height of the burst center except by the ratio between the number of air bursts and graze bursts. In both range and direction the relation of the shots to the target is easily determined.

Sec. IX.—FIRE FOR ADJUSTMENT.

1968. Adjustment may be dispensed with only when the necessary data have been determined by previous fire, or when the range is very short. The greatest difficulties arise from errors due to personnel, rather than matériel; for example, from failure to set the scales exactly as ordered or to center the bubbles; from not noticing and correcting any derangement of the laying due to loading or of the settings due to firing; from not turning the projectile in the fuse setter in the proper manner and from similar mistakes.

1969. Adjustment is effected upon the target itself, if practicable. In many cases, however, the target will not be visible to the officer conducting the fire, though its approximate position may be known. Thus, the target may consist of troops concealed behind a ridge, or behind a wall or hedge, or in the edge of a village, a forest, or a field of standing grain.

Some prominent feature of the terrain in or near the enemy's known positions—for example, a tree, a house, a mass of rock, etc.—is then selected as a **registration mark**, and by means of scouts, observers in balloons, or any available means, the enemy's location with respect to this mark is determined within the narrowest possible limits.

The fire is then adjusted upon the registration mark, and the area within which the target has been located is searched by the subsequent fire.

1970. If the circumstances permit, advantage may be taken of lulls in the action to secure at least a rough adjustment upon localities in which the enemy is known to be, or near which he is expected to appear. Such a fire is termed **fire for registration.** The data are thus secured for opening promptly an effective fire upon an enemy appearing at or near the positions upon which the fire has been registered; by minor modifications in these data a quick adjustment on the target may be secured.

1971. Adjustments of four kinds are required, viz.:

1. **Adjustment for direction.**
2. **Adjustment for distribution.**
3. **Adjustment for height of burst** (time fire only).
4. **Adjustment for range.**

Adjustment for Direction.

1972. When direct laying is employed, the battery commander makes such changes in deflection as may be necessary to bring the fire of each gun to bear upon its proper portion of the target. When shots go wide of the target it should be more accurately designated.

1973. When indirect laying is employed, the error of the piece which is most nearly directed upon its proper part of the target is measured or estimated in mils and a corresponding correction in deflection is applied in the appropriate sense.

Adjustment for Distribution.

1974. A change in deflection difference is based on the observation of the preceding salvo. It should be made on the piece which, for that salvo, is nearest to its proper direction, or on which the deflection is changed.

1975. As adjustment progresses the fire may be either concentrated or distributed. If observation is difficult, concentration upon the most prominent part of the target may be advisable; if at the same time a cross wind is blowing a point of adjustment to the windward of the target may be selected.

1976. If several batteries are adjusting simultaneously upon a single broad target, it is generally best for each to concentrate during the adjustment upon the corresponding part of its section of the target—for example, the windward flank.

1977. The simultaneous adjustment of fire by several batteries upon the same target should not be attempted unless it is possible to distinguish clearly the shots of the different batteries firing; the adjustment should be made by one battery only and verified by the others in turn.

Adjustment for Height of Burst.

1978. For adjustment of time fire a low burst center giving a large percentage of bursts on graze is desirable. The opportunity is thus given to observe both bursts in air and bursts on graze. Moreover, considerable effect may be produced during the adjusting series, and by a small change in the corrector, passage to fire for effect may be quickly accomplished.

1979. When the mean point of burst is at a height appropriate for adjustment, about one-third to one-half of the shrapnel may, on account of errors of the fuse, of laying, etc., be expected to burst on graze.

This indicates a mean height of burst from zero to 1 mil above the target. Wild shots should be disregarded, as being probably due to incorrect laying.

1980. When indirect laying is employed, an error in calculating the site will cause a corresponding error in height of bursts. As the cause of the latter error may not at first be known, adjustment of the height of burst by changing the corrector may be attempted. If the error in height of burst is not great, it may readily be allowed for in this way; but if it is seen that the necessary correction will exceed the limits of the corrector scale, the total correction which has been applied to the corrector must be transferred in the same sense to the site, and a return to a corrector setting near the normal must be made.

Similarly, for direct laying, a change of site may be made instead of corrector, to avoid exceeding the corrector scale.

Adjustment for Range.

1981. Adjustment for range is usually the most difficult to obtain.

1982. The refinement to which fire for adjustment can be carried depends on conditions. Many targets are able to shelter themselves from fire. Hence early physical effect must be obtained unless moral effect only is sought. In time fire there is necessarily a moment when adjustment must cease, for the most suitable height of burst for producing effect is not a suitable height for observing for range. For all those reasons, then, adjustment for range usually consists in determining two ranges, one of which is less than the true range of the target and one of which is greater. The determination of these two ranges is called **bracketing** the target. The difference between the two ranges is called the **bracket.**

1983. If the target is surely included within the limits of the bracket finally accepted, it may be reached more or less effectively by subsequent fire. The first consideration, then, is to determine that fire at a certain range is surely short of the target, and that fire at another and longer range is surely over the target. A second but very important consideration is to reduce the difference between those two bracketing ranges as much as possible.

1984. If the first range is **short,** the range is increased; if **over,** it is decreased and rounds are fired successively, increased or decreased in range, as the case may be, until the target is bracketed.

Having bracketed the target, the size of the bracket may be successively reduced by halving the last bracket obtained; that is, by firing at the mean of the last two bracketing ranges.

As the depth of the bracket decreases, so should the number of observations on which each limit is based increase.

1985. The amount of changes in range for obtaining the first bracket depends upon the accuracy of preparation of fire and the nature of the target.

1986. When ranges are estimated or taken from a map on which the positions of guns and target can not be accurately located, the first bracket should be obtained by changes of 400 yards.

When an accurate range finder has been expertly used, or when the range has been accurately determined by other means, 200-yard changes are appropriate.

1987. In firing over friendly troops near the target the bracket may be obtained by smaller successive changes of range.

1988. If the sense of the bursts is **doubtful,** or if the bursts are lost, circumstances must decide whether to change the range or to change only other firing data for the next round.

If the smoke of the fire of other batteries has interfered with observation, a salvo concentrated upon some prominent part of the target may be of assistance.

If the doubt was occasioned by the fact that the bursts were in air and high, it may be well merely to lower the point of burst for the next salvo.

If a salvo is lost, the projectiles have probably burst wide of the target or in a ravine or behind some intervening cover. If the smoke of the bursts does not rise and become visible after a few seconds, the lay of the ground should determine whether to increase or diminish the range or merely to raise the corrector so as to obtain visible bursts in air. Definite information may generally be most quickly obtained in such cases by securing time bursts just above the level of the crests or other cover.

1989. The trajectory may be brought upon the target by changing the site or by changing the range setting. In the latter case, if the site is in error the fuse will be set for a range other than the true range to the target, and the projectile will burst too high or too low, as the case may be. Modifications of the corrector or of the site will in general be necessary to bring the mean point of burst to the desired height. If the error has been small, it may readily be overcome by a proper use of the corrector.

1990. In the accurate adjustment of time fire, not only the height but also the burst interval is important; for projectiles bursting too far in front of the target and those bursting in the air above it produce little or no effect. The burst interval is correct when both the range and the height of burst are correctly adjusted. Indications that such is the case are: (1) That the bursts on graze bracket the target; (2) that the mean height of burst is about 3 mils; (3) that fragments from the air bursts strike the ground both in front and rear of the target, and that the pattern made by these fragments, as revealed by the dirt and dust knocked up, is close and dense rather than greatly extended; (4) that obvious effect is produced upon the target.

If doubt exists as to the burst interval, it is best to lower the corrector and get a group of low bursts or bursts on graze.

1991. At medium ranges a change of 4 mils in the site produces a change of about 100 yards in range; hence, if the site is materially altered, the adjustment of the range will have to be recommenced.

1992. At medium ranges a change of 4 points in the corrector produces a change of about 100 yards in burst range.

1993. If percussion fire is to be used for effect on material objects, called **fire for demolition**, very accurate adjustment of range is required. Such fire is effective at all ranges but, because the probable error in deflection increases and the danger space decreases, while observation grows more difficult as the range becomes longer, effect can often be obtained at the longer ranges only at the expense of much ammunition.

Percussion fire may be said to be adjusted only when effect is plainly observed, or when, of many rounds fired at a single range, the number of **overs** is equal to or slightly greater than the number of **shorts**.

Method of Fire for Adjustment.

1994. The method of fire depends on the target—its nature, size, condition and range; the method of laying, conditions of observation; firing data already determined and other considerations.

1995. Fire by battery salvo has the advantage of increasing the chances of discovering abnormal errors of gun service and of observing more than one round, thus establishing quickly the basis for changes of direction, height of burst, and range. When the range has been accurately determined it increases the probability of obtaining both shorts and overs at the first salvo and effect on a wide front of the target. It also has the advantage of at once setting all of the trail spades.

Fire by piece is appropriate to check a very doubtful deflection and, in some cases, for fire for registration.

Salvos insure the identification of individual rounds and, with the exception of distribution, more accuracy in observation of fire. They are favorable to accurate service of the piece.

Volleys are faster than salvos and give better observation of distribution.

Salvos usually commence on the leeward flank of the guns, in order that the burst of one round may not be obscured by the smoke or dust of the other.

1996. The rapidity of fire during adjustment will be controlled by the necessity of observing the shots and setting off the necessary corrections. Rapid and correct decisions and quick commands on the part of the battery commander will increase the rapidity of the adjustment of fire.

1997. The kind of projectile to be used in adjustment is ordinarily the kind that is to be used for effect. The choice depends upon the nature of the target and its situation.

During fire for effect time fire is, as a rule, employed against animate targets, aircraft, searchlights; percussion fire against other inanimate targets.

During adjustment it may become necessary to change from time fire to percussion fire to lessen the probability of hitting friendly troops or for the purpose of narrowing the bracket.

Classes of Targets, Appropriate Methods of Fire, and Brackets.

1998. Targets are classified with reference to their nature, as **artillery, infantry, machine guns**, etc. They are also classified according to their movement, or power to move, as **fixed** or **stationary, transient**, and **moving**. All of these may, of course, vary as to size and as to degree of movement.

Fixed, or stationary, targets are targets which are fixed to their position for at least a considerable time. Examples of such targets are buildings, trenches, artillery in position, troops held under cover by fire.

Transient targets are those which while fully exposed to fire are likely to remain so for a very brief time. Examples of such targets are infantry skirmish lines, machine guns, observation parties.

Moving targets are those which are changing their location. Examples of slowly moving targets are large bodies of troops on the march, infantry whether on the march or advancing to the attack, wagon trains on the march. Examples of rapidly moving targets are artillery at fast gaits, charging cavalry, cavalry at fast gaits, small bodies of mounted men, motor cars.

1999. Against **fixed targets** salvos are ordinarily used during fire for adjustment, which is usually continued until a suitable bracket has been obtained. A bracket of 100 yards should ordinarily be sought; either time or percussion fire is used, depending on the target.

2000. Against **transient targets** salvos are usually appropriate during fire for adjustment, time fire being used.

A bracket of 200 yards is usually the narrowest that can be attempted. In extreme cases it may be necessary to assume a bracket of considerable depth, based on the observation of the first bursts. Volleys are used in fire for effect. Against instantaneous targets, such as reconnaissance parties, no bracket is sought, but time fire is executed over a wide front and great depth, at maximum rapidity.

2001. Against large targets moving slowly, such as heavy artillery, troops in defiles, wagon trains, etc., either direct or indirect laying may be used.

In direct laying, volleys are usual during fire for adjustment, as this method gives the pointer more independence in the instant of firing, and he is better able to take advantage of the movement when the target is most visible. In indirect laying, salvos are usual during fire for adjustment. Time fire is used. A bracket of 200 yards should ordinarily be attempted. Volleys are used in fire for effect.

2002. Against rapidly moving or small moving targets, or targets likely to move rapidly, volley fire is usually appropriate, both in fire for adjustment and fire for effect. If the motion is in direction of the range, a bracket of 600 yards is usually the narrowest that can be attempted. Time fire is used. If the target is small, indirect laying is usually ineffective; aerial targets come in this class.

(See also detailed discussion of different targets, under "Fire for Effect," Art. 2016 et seq.)

Sec. X.—FIRE FOR EFFECT.

2003. Every target attacked will present its own problem, which must be solved according to existing conditions and not by adhering to any fixed rule.

Having completed preliminary adjustment and opened fire for effect, observation is continued, and such corrections are made as will serve to perfect the adjustment or meet changes in the location or formation of the target.

Range in Fire for Effect.

2004. It will seldom be possible to obtain an adjustment close enough to justify remaining at a single range during the delivery of fire for effect. The short and long limits of the bracket should be considered as inclosing an area to be covered at successive ranges. This can be accomplished by using either successive increments or successive decrements, so that the target will be covered at one or more of the ranges used. The officer conducting fire may be able to form an opinion as to which are the most effective ranges. The first range differences should usually be 100 yards, but when the area has been narrowed as a result of observation they may be reduced to 50 yards.

2005. In firing at moving targets the first range used should ordinarily be that limit of the bracket toward which the target is moving.

The first range appropriate for other targets depends upon consideration of the purposes of the fire for effect, the conditions of observation, the position of friendly troops.

2006. In firing over friendly troops advancing to the assault, fire at the target should cease upon a suitable signal from the infantry that the fire is dangerous. The exact time depends on the range, terrain, and conditions of observation. The range may be increased to hinder the bringing up of hostile supports or to cause losses should the enemy fall back.

At medium ranges over level ground the danger space to infantry from well-adjusted time fire extends for a distance of about 300 yards in front of the target. This distance becomes less if the ground rises toward the target; greater if it falls toward it.

Height of Burst (for Effect).

2007. A height of burst from 2 to 4 mils is theoretically best, the effect varying little between those limits and decreasing rapidly outside. But a low burst is better than a high burst, and latest information from actual firing seems to indicate that a mean height of about 2 mils is generally most effective.

Distribution (for Effect).

2008. The fire of a battery is usually distributed over the front assigned it for attack.

When time fire is employed the following considerations are to be borne in mind:

(a) If the front to be attacked does not much exceed 12 mils in width, it is sufficient to converge upon the center of this front, as the dispersion of fire, when a considerable number of rounds is fired, will provide for covering the full front.

(b) Fronts which do not much exceed 35 mils may be covered effectively by a 4-gun battery using distributed fire.

(c) If the front much exceeds 35 mils, it may be divided into sections and each section attacked in turn.

2009. In shrapnel time fire the right piece is directed not upon the right edge of the target but upon a point about 10 yards inside of the right edge. To direct the left gun upon a corresponding point inside the left edge, the divisor of the front of the target is the number of guns firing, not that number decreased by one (See Art. 1906, Distributed Fire.)

2010. When the mean height of burst of shrapnel is well adjusted, each gun is expected to cover effectively a front of 20 yards if 1 round is fired, 25 if 2 are fired.

2011. When **percussion fire** is employed, the nature of the target determines whether converging or distributed fire is to be employed.

If the target to be attacked has a continuous front, e. g., walls, obstacles, etc., this front may be divided up into sections of 10 mils each and the sections attacked in turn, each gun taking its proportionate part. If the target has a much smaller front than 10 mils, the fire may be converged upon its center. If the target consists of artillery, each gun may be assigned a corresponding gun, depending upon the amount of artillery available.

Method of Fire (for Effect).

2012. The **rapidity** with which fire for effect should be conducted depends principally upon the tactical situation. After adjustment has been obtained the volume of fire may be increased, by increasing the number of pieces, or by firing in more rapid succession than is practicable during fire for adjustment, or by increasing the number of rounds in each volley.

Rapidity of fire must never be so great as to prevent fuses being exactly set and the guns accurately laid, or otherwise to interfere with the work of the gun squads.

Great rapidity of fire is permissible only for a short time. The expenditure of ammunition is otherwise too great.

2013. Volley fire is adapted especially to the attack of fugitive targets that are more or less vulnerable. The special characteristic of this method of fire is its great flexibilty and rapidity. The number of volleys to be fired, their range difference, the number of rounds in each volley are all in the hands of the officer conducting the fire. By suitable manipulation of the sheaf he may readily shift the fire from point to point of the terrain, as necessity may require, and by adapting the bursts of fire to meet the crises of the action he may utilize the ammunition to the best advantage.

2014. While **salvos** are adapted especially to securing the adjustment of fire, they may also be used for producing effect, especially with the idea of obtaining at the same time additional information on which to base a closer adjustment of the fire. They are employed according to the principles of volley fire.

2015. **Fire at will** is employed solely for the close defense of the guns.

Against a slowly moving enemy, such as infantry, the fire should be commenced when he has arrived within about 350 yards of the gun; against a rapidly moving enemy, such as cavalry, when he has arrived within about 800 yards; the purpose in both cases being surely to establish a fire-swept zone through which the enemy must pass in order to reach the guns.

Obstacles—Intrenchments.

2016. Many obstacles may be destroyed by light artillery, but always at a price of a large expenditure of ammunition; they are attacked by high-explosive shell or percussion shrapnel.

Defenders behind stone walls may best be reached by demolition of the walls.

Earthworks can only be damaged. The fire directed on them should be destined only for the defenders who are sheltered by them; percussion shrapnel or high-explosive shell will be best.

Woods.

2017. If the borders are occupied, woods are attacked with time fire.

When it is desired to reach troops concealed in the interior of a wood they are attacked with percussion fire.

Reconnaissance and Staff Parties.

2018. These are very important targets, vulnerable, but furnishing only fleeting opportunities.

Time fire is executed over a wide front, with a long bracket and maximum rapidity.

Personnel of Command, Observers, Signalmen, Telephonists.

2019. These are important targets of variable vulnerability. They present a certain fixedness. The front covered is narrow, and the bracket is reduced more and more. Time fire is used, followed by percussion fire if the target is on an observing ladder.

Cavalry.

2020. Cavalry is very vulnerable at a halt and when in close formations. It protects itself against artillery fire through its mobility and dispersion.

Time or percussion fire is used, and all measures are taken to increase the rapidity of the fire. If the firing unit is not placed so as to have a direct view of the target, the sheaf is opened and fire over a deep bracket is commenced when the cavalry enters the area under observation. If direct laying can be used the target is followed by all the pieces, a wide bracket is sought and then searched by volley fire, commencing at the limit which the target is approaching.

The opportunity of firing on cavalry will be fugitive; the fire of short duration. The maximum rapidity of fire is essential whether by time or percussion. When cavalry directs its attack against a battery, the battery will act advantageously in establishing a barrier by percussion or time fire in front of the enemy's line.

Artillery.

2021. Artillery presents targets widely varying in vulnerability.

The greatest vulnerability exists from the commencement of the reconnaissance until the occupation of the hostile position is accomplished; that is, up to the moment that the enemy's artillery is ready to fire. Its retirement from under fire is also a most critical moment, especially when the retirement is made by an entire unit.

2022. Against artillery in position, the first object is to gain the ascendancy over it by inflicting as much damage as possible upon the personnel. Immediate effective fire is particularly demanded if the enemy can be attacked at a disadvantage.

Due to the difficulty, however, of reaching effectively the personnel of batteries provided with shields and posted in masked positions, the struggle between evenly matched artilleries will often be long drawn out. If the enemy's artillery is temporarily overmatched, it may suspend its fire and shelter its personnel; but it must be expected to renew the struggle as soon as the pressure upon it is relieved. The aim must be to gain the superiority of fire by suitable concentrations of effect on the part of our own artillery; the opportunity may then be gained to destroy the enemy's matériel by well-adjusted shell-fire.

If the pieces are not seen, fire for demolition can not be employed without waste of ammunition; but such artillery has nevertheless a certain vulnerability to time fire. There are always observers and members of the gun squad who are incompletely sheltered, and who are less so, generally, when the artillery is firing. The effect obtainable from time fire is increased when the batteries against which it is directed are under an oblique fire.

A sufficient recession from the covering crest or from the mask renders an objective absolutely immune; for it is impossible to attack an indefinite depth of terrain. On the other hand, the greater the distance from the mask which the enemy is forced to take the more difficult become hostile communication and command.

2023. The varying conditions indicate the following principles governing conduct of fire against an artillery target.

If priority in occupation of position is obtained, careful observation is made of indications of the enemy's reconnaissance and occupation of positions. At the moment of these operations time fire is opened through a large bracket, over a broad front, at maximum rapidity. This will be repeated, if necessary, the adjustment being refined.

If priority of occupation is not obtained, a different procedure is advisable.

When the pieces of the hostile artillery are visible, time fire should be used at first to reach the uncovered personnel and to produce a demoralizing effect. This effect is then extended to the personnel under cover by the use of time fire, the limits of the bracket being reduced as much as possible, and the front covered being limited to the actual front of the target. The effort is continued to destroy the personnel and then the demolition of the matériel by percussion fire is attempted. Fire is delivered on all visible pieces as accurately as possible and continued until that result is obtained, if conditions justify the expenditure of the necessary ammunition.

When the hostile pieces are not visible, their presence may be disclosed by the flashes, by the dust raised by fire, or by other indications. The method of attacking them is similar to that just described, except that study of maps and terrain must be made to establish the far limit of the bracket, the near limit being the covering mask, and that fire for demolition can not be usually undertaken. If it proves impossible to reduce the limits of such a bracket, it is advisable to await the appearance of new indications. The firing unit remains in observation of the target, and a minute search is made for its observers or its battery commander's station. If these are discovered, efforts should be made to destroy them.

2024. Fire for demolition requires great accuracy in range and direction, thereby necessitating careful observation of each round from each piece. Its employment is permissible only when the nature of the target indicates that fire for demolition must be carried out and when the number of batteries at hand is such as to limit the front to be attacked to about 100 yards per battery. If the target is such that fire for demolition is not admissible, a 4-gun battery will give a sufficient volume of time shrapnel fire against an artillery target, however dense it may be, provided the front does not exceed 200 yards.

Infantry.

2025. Infantry, like artillery, offers targets of variable vulnerability. But while the artillery of the enemy once in place constitutes a definite target, the infantry target changes form, dimensions, density, and sometimes position from one instant to another. An artillery target may sometimes be destroyed; it is practically impossible to destroy a body of infantry, whose elements avoid fire individually and may sustain fire almost without loss.

Finally, it may be said that artillery is proportionally small in quantity, and that, by reason of the power of even a single piece, each unit or sub-unit which is seen or is firing is of sufficient importance to be attacked, while the infantry exists in very large numbers, is almost everywhere, but is in fractions of small importance. Because of their weakness these small fractions do not attract fire, or by their multiplicity oblige those who wish to fire against them to disperse their fire. Fire against infantry targets will often fail to produce great losses, but other results may be expected.

2026. Against infantry in position and more or less protected by entrenchments the intensity of the fire should be regulated to suit the necessities of the case, as our infantry advances to the attack, being slow or ceasing entirely while the enemy is concealed or inactive, rising to great intensity when the crises of the action develop and the enemy exposes himself to meet them. Salvos may be used for the ordinary phases of the action, volleys for the crises, the object being to assist our own infantry by inflicting as much damage as possible upon the enemy; by destroying his morale; by forcing him to keep under cover; and by preventing effective fire upon his part.

2027. A slowly moving target, such as infantry, or mounted troops impeded in their march, may be quickly bracketed by salvos and then attacked by searching fire.

Infantry in march formation may be thus attacked, but immediate deployment on their part is to be anticipated, and the officer conducting the fire should be prepared to reach them, probably behind cover, with a well-distributed fire.

Infantry moving to attack in deployed lines, a succession of thin lines, or in line of small columns may be met by volleys successively reduced in range as the infantry approaches. If their formation is in line of small columns, the fire should be distributed so that a piece may bear upon each of the columns.

At close ranges infantry will probably endeavor to advance by successive rushes from cover to cover. Such rushes may be met by volleys previously prepared for upon selected positions, evidently in the immediate path of the enemy. If the positions occupied by important bodies of the enemy during the intervals of advance are well defined, accurately adjusted fire may be brought to bear upon such positions, and the ground between successive positions may be covered by searching fire when important movements of the enemy from one position to another are attempted.

Machine Guns.

(See next chapter.)

2028. Machine-gun groups have much the nature of infantry attacking, but they are of greater importance than small fractions of infantry on account of their great volume of fire. If they are discovered to be firing, they should be attacked with time fire over a broad front and with a deep bracket. Under the best conditions of observation from a station near the guns the bracket can not usually be reduced below 200 yards. Owing to the ability of the personnel to disperse and to seek cover, the fire must be rapid. Once forced to cease firing, the area containing the machine guns should be kept under close observation, with a view of preventing resumption of their service or their withdrawal for use elsewhere.

Aerial Targets.

2029. Fire against targets in the air generally requires the assignment of particular units to the purpose, the digging of circular trenches about 36 inches deep for the trails to permit the use of high angles of elevation, and the organization of a system of lateral observation with means of sure communication between observers and battery commander's station.

2030. Captive balloons are very vulnerable within the limits of the trajectory and the action of the fuses. They have slight motion within narrow limits, and are attacked by direct laying with time shrapnel. It is indispensable that the rounds be correct for deflection. Ranging is commenced, unless the range can be measured, at the long limit of the fuse to ascertain whether the balloon is within time-fire distance, and the bracket is obtained and fire for effect conducted by the usual methods except that for effect the burst height should be greater than normal to insure wide dispersion in the shrapnel cone. When a range finder is used, a bracket may be assumed on the basis of the first observations for range.

Dirigibles and aeroplanes are vulnerable, but very difficult to hit, especially for ordinary field guns. Direct laying is used with time shrapnel. The battery is divided into two parts. Each fires separately, one beginning at the far limit, the other at the short limit, of an estimated bracket as wide as 2,000 or 3,000 yards. Each fires volleys of one or two rounds at ranges differing by 200 yards, the successive ranges approaching the center of the bracket. When the bracket has been covered or when lateral observations indicate that the target is out of the bracket the process is repeated.

If the range finder is used, a narrower bracket may be attempted.

As aircraft may readily change their direction, height, and speed, deflection and corrector changes will usually be necessary during firing. Essentials of success are rapidity and accuracy in service of the piece, skillful operation of the range finder, and, on the part of the officers conducting the fire, quick decision and command, and boldness in changing ranges without delay.

Targets with Respect to Terrain.

2031. Targets may also be considered with respect to the nature of the terrain on which they are situated.

An enemy entering the dead space existing in front of a battery can not be attacked by ordinary means. Some effect may be obtained by an early burst at the minimum elevation of the piece necessary to clear the mask. If the corrector scale is not sufficient, the expedient may be used of increasing the site by successive increments of 5 mils each and by decresaing the range 200 yards for each increment of 5 mils. This decreases the range to point of burst by an amount roughly corresponding to an equal change of the corrector. This kind of fire is appreciably effective only within very narrow limits.

On a horizontal terrain with site 300, range 2,000, the effect may be considerable, even when the target is under the highest part of the trajectory. If the range is greater than 2,000 yards, or if the terrain falls off abruptly beyond the mask, the effect decreases rapidly and ceases to be appreciable when the target has penetrated the dead space a very short distance.

2032. If a target is scattered over ground sloping toward the guns, the points of burst may be kept at an effective height above the terrain by making simultaneous changes in range and corrector in the same sense; that is, if searching up the slope, by increasing the range and raising the corrector at the same time.

2033. If the area to be searched is not deep and the slope not great, a mean value of the site may be taken, and a corrector used which will give low bursts at the near limit of the area if the slope is away from the guns, and bursts slightly above the normal if the slope is toward the guns. This method will always be used if great rapidity is desired. For searching long and steep slopes, however, it is better to use the site of the near limit of the area to be searched and vary the corrector from volley to volley or salvo to salvo, raising it if searching up the slope or lowering it if searching down the slope.

2034. A target marked by a crest may always be attacked as though it had considerable depth. To overcome the effect of the slope of the terrain, increases of range must be accomplished by lowering of the corrector. The steeper the slope the less will the range be changed and the more the corrector.

For example, if the terrain has a slope of 60 mils, increasing the range setting by 50 yards and lowering the corrector by 2 mils will increase the burst range by about 100 yards; if the slope is 90 mils, a range increase of 25 yards and a corrector diminution of 3 mils will cause a change of about 100 yards in burst range. The height of burst above the point of impact will not be materially changed in either case.

If percussion fire is used, range changes to correspond to normal 100-yard bounds must be less than 100 yards, the amount depending upon the steepness of the slope. Slopes greater than the angle of fall can not be struck by percussion fire.

2035. Percussion fire of shrapnel may be very effective against animate objects beyond a crest on slopes giving bursts on ricochet. At 3,000 yards ricochet may be expected from slopes of 50 mils or more. The slope most favorable for effect is one of about 115 mils. However, both ricochets and effect are greatly influenced by the character of the soil. When effect by such fire can be obtained, it is possible to avoid complicated changes of corrector to overcome the influence of slopes.

Night Firing.

2036. If searchlights are available, firing may be conducted against targets of all kinds the same as by daylight up to the effective range of the lights. It will often be necessary to fire as at instantaneous targets to take advantage of brief periods of illumination.

In any case preparation of fire should, if possible, be made before dark, and with the greatest possible accuracy.

2037. To permit of turning fire upon different targets or areas, direction is taken to a principal registration point. The angular distances from this point to the various targets or target areas are then measured and recorded, and also the breadth of front of each. If guns have been placed in position, it is well to verify the directions by registration shots.

These data will be entered on a sketch; each target or area will be designated by a letter, care being taken not to use letters of similar sound, and opposite each target will be noted the range, site, corrector setting, deflection from the registration point, and breadth of front.

2038. If the preparation can not be made before dark, it is impracticable to fire at all, except at illuminated targets. For this purpose an auxiliary observer on a flank is necessary, with whose assistance a broad bracket is obtained, and fire for effect opened upon the bracket with ranges differing by 100 yards. Ranges should be eliminated or added, according to the reports of the auxiliary observer.

Star shells, if available, may be used for illuminating the target, the bursts being adjusted to come **over and behind** the target, thus showing the target silhouetted against the light.

2039. For indirect fire at night, stakes carrying lanterns may be provided as aiming points. Similar stakes may be used by observers to fix the directions to targets. Sights must be illuminated.

Sec. XI.—ARTILLERY IN THE FIELD.

2040. The **characteristics** of field artillery are:

1. Great power concentrated in a relatively small tactical unit.
2. Rapidity of fire.
3. Long range.

4. Ability to act from concealed positions.

5. Limited mobility, especially in rough country, and where only man power is available for transport.

6. Ability in general to defend itself against a frontal attack, but weakness against a flank attack—though the dragmen (supports) assist materially in this regard.

2041. Employment of fire.—The power of artillery should not be frittered away in desultory bombardments nor upon unimportant targets. Its employment is to be adapted to the phases of an action, so that it may exert the strongest influence upon the important objectives and at the critical moments.

The opportunities of striking an enemy while he is vulnerable are ordinarily intermittent and brief. They occur, for example, when the enemy moves from cover to cover, or when he exposes himself in order to contend effectively against our own troops.

Suddenness of action is thus often a necessity. If the action is also by surprise, effect, especially the moral effect, is increased.

The outburst of rapid fire called for will therefore be intermittent, depending upon the nature and phase of the combat.

A prolonged deliberate fire, however, may be requisite for destroying material objects; for holding a sheltered enemy under subjection, preventing his supply and reenforcement, and precluding his effective interposition in the engagement; for searching for an enemy's reserves, etc.

Opportunities for using flanking and oblique fire must be sought.

These methods of action are made possible and effective by timely reconnaissance, by skillful selection and occupation of positions, by careful preparation, and an efficient conduct of fire, and by thorough cooperation with other troops.

2042. Preparatory dispositions.—Premature commitment of artillery to action is to be avoided.

Readiness for action is secured and freedom of maneuver retained by posting artillery in or near suitable concealed positions, and making all preparations for meeting the probable phases of the action.

2043. To facilitate definite assignment of duties, batteries are classified as follows:

(1) **Counter batteries** are those specially designated to combat the enemy's artillery.

(2) **Infantry batteries** are those assigned to prepare and support the infantry attack. They are further classified into **batteries of preparation**, which fire on the opposing infantry; and **breaching**

batteries, whose mission is to open passages in the enemy's line, through which our troops may advance.

(3) **Batteries of the counterattack**, to assist in defeating any counterattack the enemy may make. They are posted in observation or readiness.

(4) **Decoy batteries**, to draw the fire of the enemy's artillery which has not disclosed itself, or to divert their fire from the main attack. They are usually posted in an advanced position, at wide intervals, and make up for small numbers by great rapidity of fire.

(5) **Accompanying batteries**, to advance to the close support of the infantry attack. This may or may not involve actual movement forward, but refers rather to accompaniment by fire.

The Use of Supports (Dragmen).

2044. After the guns are in position, the dragmen constitute the supports, and are deployed or held under cover in order to minimize losses, but near enough so that they can be readily called on to shift the position of the pieces or to support them against an infantry attack, especially a flank attack. Where there is no probability of such a situation arising, they may be formed into infantry companies and added to the firing line. But it must be borne in mind that the artillery thereby becomes practically immobile, and in the event of an unexpected change in the tactical situation, requiring the advance of the guns to attack a new target, or their retirement to avoid capture, neither situation can be taken advantage of. Moreover they become especially vulnerable, as there are now no men available for their support, or even for the replacement of casualties.

It is better to consider the artillery supports as a part of the infantry reserve, to be detached only in extreme cases; but since such cases are precisely the ones most likely to require the presence of the artillery supports at the pieces, the decision for such detachment should be made only after a careful consideration of the tactical situation, with an eye to eventualities. (See **art. 862** et seq.)

Choice of Position.

2045. The area within which the field artillery must take position depends on the plan of action decided on by the commander of troops.

The choice of position must be such as to make the best use of the terrain within these limits.

2046. The only invariable rule in the choice of a position is so to post the guns as to be able to carry out effectively the task assigned them.

Important considerations in the choice of a position are:

1. Obtaining an effective range.
2. Securing a large field of fire.
3. Concealment from view.
4. Facility of movement to the front, flanks, and rear.
5. Proximity of good locations for observing stations.
6. Favorable conditions for resupply of ammunition.

Positions combining all of the above qualifications are seldom or never found. The choice as to which consideration carries most weight depends upon the tactical situation.

By a suitable choice of positions and of observing stations the greater part of the terrain within range of the guns may be included within the field of fire and the dead space reduced to a minimum.

2047. When not incompatible with the effectual accomplishment of the duty to be performed, concealment from view is always to be sought. This is true whether direct or indirect laying is employed. By rendering the guns inconspicuous or entirely concealing them their sustained service may be counted upon, while the difficulties of the enemy in locating his targets and adjusting his fire are increased.

2048. The principal means of concealment is the defilade of the guns from all points within the enemy's position. Complete concealment requires the flashes of the guns to be invisible from the enemy's position. Such concealment requires in daylight a defilade of about 12 feet.

2049. In the selection of a position it is necessary to determine the defilade which can be secured while keeping the trajectory, at the shortest range to be used, above the mask affording the concealment.

2050. When direct laying is to be used, the necessity for seeing the target through the sights fixes the position to one very near the line from the mask to the target. Similarly, little concealment is possible when very short ranges must be used.

2051. Positions which, from the enemy's point of view, are on the sky line are usually the most conspicuous. By placing the guns below the sky line, so that they will have a favorable background, and by preventing movements of the personnel, a battery may be unrecognized, even though it is in the open. It is important, however, to have a crest, a hedge, or a clump of trees in front so as to increase the enemy's difficulty of observation and of exact location. In the absence of natural cover artificial means may be used to conceal the guns, as, for example, by tying branches of trees to the wheels, etc., and thus breaking the outline.

A position in rear of a crest, with a parallel crest of about the same height in front and some distance away, offers many advantages. The enemy is apt to mistake the crest nearest him for the one actually occupied and to consider shots falling between the crests as beyond his target. The trees, a hedge, standing grain, etc., 400 or 500 yards in front of the guns, and so that the line of sight just passes over them, may similarly serve to deceive the enemy as to the actual position.

When indirect laying is to be employed, a position on a gentle slope just far enough behind the crest to insure the concealment of the flashes best facilitates running the guns up to the crest should direct laying be called for. If the position is discovered by the enemy, however, and the crest is plainly seen by him, the guns are in a very vulnerable position, as shrapnel may be employed to search such a reverse slope very effectively.

The most advantageous position, from the point of view of concealment alone, is one more than 400 yards in rear of a covering mask, having flash defilade and hidden from the view of any auxiliary observers whom the enemy may push to the front and flanks.

A position on the counter slope is frequently advantageous in reducing dead spaces, facilitating ammunition supply, and securing suitable observation stations near the guns.

2052. Protection from observation by aircraft is obtained by posting the guns under trees, by placing brush or small trees around the guns, by providing an overhead screen of the same color as the surrounding terrain, and by any means of breaking the outlines of the matériel. Complete immobility on the part of all the personnel during the time that hostile aircraft are in observation is also an important means of avoiding notice.

2053. Firing over friendly troops.—Firing over our own troops is to be regarded as a normal procedure.

Freedom is thus gained to post artillery so as to cover effectively the whole front of the combat and to realize the power of concentrating the fire of widely separated lines.

Projectiles should clear friendly troops by at least 10 yards. Fire over them should not be conducted with elevations of less than 1,000 yards, or when they are within 400 yards of the guns. These limitations are modified by the relation between positions occupied by the target, the friendly troops, and the guns.

Reconnaissance.

2054. The duty of locating the enemy and of securing information concerning him devolves in general upon troops of the other arms.

The artillery must, however, obtain for itself such special information as is needed to insure the proper posting and the effective employment of the guns to carry out the tasks assigned it.

At the earliest opportunity the officer commanding the artillery reconnoiters and selects the positions for the artillery in accordance with the instructions which he has received and the tactical requirements of the situation. He causes his immediate subordinate commanders to accompany him or informs them when and where they are to report to receive their instructions.

2055. When a commander goes forward for reconnaissance he instructs the officer left in command on the following points, so far as may be desirable and practicable: (1) The tactical situation; (2) whether or not the command is to follow at once; (3) the time and place for subdivision, if such subdivision is to be made; (4) the route to be followed; (5) the rate of march. Additional instructions may be transmitted from time to time by markers, who should be left at places where uncertainty as to the route may arise or where difficulties are to be avoided. As soon as the position and the best method of approaching it have been determined upon, agents or scouts may be sent to meet battalions or companies and guide them by the most favorable routes to their respective positions.

2056. In undertaking a reconnaissance an artillery commander should have a clear idea in his mind of the general plan of action and of the task to be accomplished by the force under his command. Unembarrassed by details, he should study the tactical situation and the lay of the ground, select the position with a view of carrying out his special mission, and arrange for the necessary preparatory dispositions. The details of securing information, etc., should be performed by reconnaissance officers and scouts.

2057. An artillery reconnaissance officer may be attached to advanced troops, and if so he should, as soon as possible after the determination of the enemy's location, submit to the artillery commander a report giving all obtainable information as to the enemy and describing the most suitable position of our own artillery. This report should be accompanied by a sketch, showing the enemy's position, the position selected for our own artillery, the characteristics of the country intervening between the two, and such other important information as may be readily set forth. The report should embrace information such as the following relative to the position selected: (*a*) The various routes of approach and their relative practicability, stating difficulties, if any; (*b*) possibility of approach under cover; (*c*) whether direct or indirect laying is recommended; (*d*) cover afforded for guns; (*e*) need of providing artificial cover; (*f*) number of guns which may be posted advantageously in the position; (*g*) facility for resupply of ammunition; (*h*) in case indirect laying is recommended, possibility of securing good aiming points and good observing stations and of firing over intervening obstacles.

As to the enemy, the report should include information as to: (*a*) The most important and immediate targets; (*b*) location and strength of the various hostile bodies; (*c*) location or probable location of the hostile artillery.

Advance to and Occupation of the Position.

2058. Artillery commanders habitually precede their commands to the position to be occupied.

Before the arrival of his guns, each c. c. should have determined exactly where they are to be posted. Ordinarily he remains in observation of the terrain and targets assigned him, and sends his c. p. o. back with exact instructions to the senior pt. c., as to the position to be occupied, the route to be followed, etc. If necessary, however, he meets his company at a short distance in the rear, and personally conducts it to its position.

2059. Reconnoitering parties, scouts, and other members of the headquarters detachment must operate so as to avoid indicating the position which is to be occupied. If exposure is necessary, it should not occur in the neighborhood of the chosen position. If the occupation of the position will be visible to the enemy, delay in establishing the guns may be fatal. In such cases it may be preferable to advance boldly to the position from which they can open fire immediately.

When the circumstances permit, it is always preferable to unlimber under cover. If direct laying is to be employed, the guns are run up by hand, after unlimbering, until each pointer can just see his target through the sights. By requiring all individuals to keep under cover and by avoiding all movements on the crest, a position may readily be occupied without the knowledge of the enemy, securing the advantage of surprise as well as safety.

2060. If positions are to be occupied at night, the route and all the details of the movement must be determined in advance by reconnaissance during the day. It is usually desirable to post markers along the route to be followed before nightfall. Such markers must be at close intervals.

Immediately after establishing the guns in position, communications are opened up with the observation station. Observers should also be posted to provide security against close attack.

2061. As soon as possible after occupation, the preparation of artificial cover against fire and observation is begun. The first cover provided should be constructed with a view of its being developed into complete protection as the occupation of the position continues. Similarly, advantage should be taken of any lull in the action to complete the cover. If the dust from the discharge of the pieces rises so as to reveal the location of the guns, it may be reduced by wetting the ground, or covering it with wet branches, or other noninflammable material. The plan to be followed depends on circumstances.

(For intrenchments see art. 1170.)

Changes of Position.

2062. If guns are rendering effective service, changes of position in the midst of an engagement should be made only when some very distinct advantage will thereby be gained. Changes involve interruption of fire, necessitate dismantling and reestablishing communication, a fresh orientation of the command and a new adjustment, and, if made in the view of a vigorous enemy, are apt to result in paralyzing losses.

Nevertheless, as an action develops changes of position may be essential. Artillery commanders must anticipate and prepare for such movements. Reconnaissance officers and scouts must be employed to reconnoiter and select routes, to remove obstacles, to perform such pioneer work as may be needed, and to prepare themselves to guide organizations over the routes selected.

2063. If a hasty movement is imperatively demanded, great losses may be avoided by skillfully using the cover afforded by the ground and by moving rapidly over spaces where exposure is inevitable. If the guns are under effective fire of the enemy's infantry or artillery, changes of position are apt to involve heavy losses, if the guns are in sight of the enemy. If the drag can be manned under cover, the losses due to the close order formation may not be great, as the movement can be rapidly executed. But if animal transportation is used, it is best to wait for a lull in the firing.

2064. Changes of position are usually in echelon, in order to keep up the fire and cover the movement of the unit which is changing position. For a single artillery company, however, the change is usually made simultaneously, unless it is necessary to cross a fire-swept zone.

2065. A change of position by certain batteries may be necessitated by the fact that the enemy has succeeded in locating them and in securing the ascendancy of fire. A short movement by hand during a lull in the fire may be sufficient in such cases.

Sec. XII.—COMBAT.

With the Advance Guard.

2066. The action of field artillery with an advance guard will vary with the mission. It should not occupy positions from which it can not be withdrawn without a general engagement, perhaps not intended by the commander of the force. Its main duties are to break down any resistance to the advance of the other arms or to cover their retirement if necessary.

Positions with as much cover as possible should be chosen, with preservation of complete freedom of maneuver, while the guns themselves should be placed at wide intervals and used with great rapidity of fire, so as to deceive the enemy, if possible, as to the strength of the force opposed to him.

Some means of transport other than man power is imperative, if artillery is to be attached to the advance guard; otherwise its lack of mobility prevents fulfillment of its mission.

The Attack.

2067. In general, when large forces are engaged, the attack presents three principal phases:

1. The preparation.
2. The decisive action.
3. Securing the victory, or averting disaster in case of failure.

The use of artillery in the attack will vary in conformity with these different phases. (See art. 671 et seq.)

2068. In the preparatory stage artillery has for its objectives those parts of the enemy's force which at the time most oppose the action of our infantry. Until our infantry comes within effective small-arms fire the principal target will therefore be the hostile artillery. As the progressive advance of our infantry brings them within effective rifle fire, more attention must be paid to the hostile infantry.

Obstacles such as walls and abatis, which impede the advance of our infantry should, if possible, be destroyed by artillery fire.

2069. The counter batteries acting from masked positions must dominate the enemy's artillery; the infantry or breaching batteries open upon the hostile infantry and obstacles.

2070. The artillery preparation for the infantry attack is in general carried on simultaneously with the infantry advance. If, however, the enemy has fully occupied his position, or the attack is able to form under cover close to the hostile position, and thus has only a short distance to advance, the preparation may take place both before and during the attack.

During this special preparation the counter batteries continue or resume their fire on the hostile artillery.

2071. In the decisive attack a special preparation is necessary. The most rapid and intense concentration of fire of all the available artillery is brought to bear upon the objective against which the infantry is to advance

2072. As our attacking infantry reaches the danger zone of our artillery the commander of the infantry firing line should, by a preconcerted signal—such as the display at the firing line of a conspicuous and suitable flag—inform the artillery commander of the fact. The artillery then increases its range, so as to impede the movement forward of possible hostile reserves and to take the enemy in the rear in case he retreats.

2073. When the third phase of the attack is reached, accompanying batteries will be designated from the infantry batteries whose mission will be to reach the captured position as soon as possible after the infantry, in order to pursue with their fire the retreating enemy and to aid in repulsing any counter attack.

2074. In case of reverse, artillery directs upon the enemy's attacking troops every gun which can be brought to bear, in order to destroy their morale and to assist the repulsed troops in the renewed effort which may lead to victory. If the repulsed troops continue to be forced back, the artillery must cover their withdrawal.

The Defense.

2075. The defense requires, before all things, skillful utilization of the available ground in order to develop fire effect to the utmost.

Exhaustive preliminary reconnaissance of the position, improvement of communications within it, determination of the ranges, especially of those to probable artillery positions of the enemy and to points in the probable direction of the infantry attack, are advantages which the defense must utilize so far as time permits.

In preparing positions which may be occupied, a most extensive use is to be made of earth cover. If time permits, it is advisable to provide masks and to improve the field of fire by cutting down hedges and trees. It is of the greatest importance to place a large supply of ammunition in readiness in the immediate vicinity of the guns.

As soon as the general direction of the enemy's attack is recognized, but if possible before the enemy brings his batteries into action, the fighting position is occupied. Sometimes flanking artillery fire can be employed with advantage to search dead angles before the fighting position.

2076. The commander of the troops will usually order the opening of fire. Firing at excessive ranges and upon small hostile detachments is to be avoided, for this assists the enemy in locating the guns.

When the enemy's infantry advances to the attack, the artillery must make them their target regardless of the enemy's artillery fire, if necessary leaving cover for this purpose. If possible, the enemy's batteries should at the same time be held in check, but the repulse of the infantry attack must remain the most important feature.

If, even before the infantry attack commences, the enemy's artillery proves itself so superior that it appears hopeless to continue the artillery action, the batteries may temporarily seek cover from the enemy's fire. But as soon as the enemy institutes the decisive attack every gun must at once resume the struggle and engage the enemy's infantry only, heedless of the artillery fire.

2077. If, nevertheless, the attack succeeds, part of the artillery must prevent the advance of hostile batteries into the captured position, part must concentrate its fire upon the hostile infantry which has penetrated, and, in cooperation with the reserves, expel the enemy from the captured position. This is one of the tactical situations in which steadfast endurance to the last is imperative.

With the Rear Guard.

2078. As the principal duty of a rear guard is to gain time, and as it should be able to withdraw without serious loss, it should be strong in field artillery. Positions should be selected so as to utilize the long range of the guns to force the enemy to deploy at the greatest possible distance; such positions must also afford sufficient facilities for withdrawing. In withdrawing, small changes of position should be avoided, the retirements from one position to another being over as great a distance as is consistent with delaying the enemy to the utmost.

As with the advanced guard, some means of motor or animal transport is imperative, or the artillery can not fulfill its mission.

CHAPTER VII.

MACHINE GUNS.

Sec. I.—GENERAL PRINCIPLES.

2089.—Machine guns may be consolidated and the personnel organized into machine gun companies and battalions, or may be separated and assigned to designated infantry and artillery companies. The former method permits greater coordination of effort, especially in major operations; the latter permits greater flexibility, especially in minor operations against poorly organized enemies, and will, under normal circumstances, be that employed in landing forces from the fleet.

2090. Whichever method of organization be adopted, the machine-gun crews must be carefully chosen, and must be thoroughly familiar with the type of gun assigned to them, including the clearing of jams. The efficient handling of a machine gun under the varying conditions of service requires a high order of technical skill and dexterity, which can only be acquired by long practice with that type of gun. A lack of this experience leads to frequent interruptions in the fire, or total inability to function, possibly at critical moments, in addition to inefficient handling of the sheaf of fire. For this reason, machine guns should be permanently assigned.

2091. When practicable, two machine guns are provided for each infantry company, and a similar number may be attached to each artillery company. These guns should always work in pairs, or within supporting distance of each other. Guns of different types should never be paired.

2092. Unless specially equipped, ships of the fleet are not supplied with a sufficient number of machine guns to provide two for each company of the complete landing force. Such guns as are available are issued to designated companies, and when necessary others are obtained from ships that do not land.

Types of Guns.

(Ordnance pamphlets: 404, 405, 405A, Browning; 406, Lewis; 430, Colt.)

2093. At present the following types of machine guns are in use in the Naval Service:

Heavy type.—Vickers, Browning heavy, Colt, and Marlin. These are fitted with carriage or tripod, and feed from a belt. The Vickers and Browning heavy are water cooled.

Light type.—Lewis, Benet Mercie, and Browning light. These have magazine feed, and are air cooled. The Lewis, due to its weight, is intermediate between the light and heavy type, and due to its method of cooling is capable of more prolonged fire than other air-cooled guns. The Benet Mercie and Browning light are also classed as "machine rifles."

2094. The heavy type has greater steadiness, due to its greater weight and form of mount, which gives it greater accuracy, especially at the longer ranges. It is especially suited for long-range covering fire. However, none of the above types, except those that are water cooled, is capable of prolonged continuous fire.

2095. The light type has greater mobility and handiness. It can be easily carried by one man to considerable distances, and can be put into action very quickly. It is especially suited for close support of the infantry, either in attack or defense, and may be used to advantage with the advance party or even with the point of an advance guard, or near the line of observation of outposts; and its position may readily be shifted to suit tactical requirements. The heavy type may also be used in the same manner, though with greater effort.

Transport.

2096. Every effort should be made to provide proper cart, or pack-mule transportation, for machine guns and their ammunition. Unless carriages are provided for the "heavy type" guns, the gun squad can transport them only short distances without the aid of special carriers. When carried by hand they are best transported slung on light poles.

The "light type" guns with their ammunition can be transported satisfactorily by the gun squad, but if the distance be long, only about 1,200 rounds of ammunition can be carried with each gun.

2097. Where machine-gun carts, Marine Corps type, are furnished or can be obtained, the guns, with spare parts, tool kits, and ammunition supply complete, can be much more satisfactorily handled and transported. Two carts are provided for each squad. They are light, have great mobility, and will transport the gun and as much ammunition as a pack mule is able to carry, with no increase in personnel.

2098. The machine-gun squad, when forced to carry the gun and equipment, does so in the most convenient manner, dividing the load as much as posible, and shifting the different loads from one to another.

Organization.

2099. A single machine gun, whatever the type, requires about one squad for transporting the gun, its equipment, spare parts, and ammunition. The squad is therefore the smallest unit of machine-gun organization.

2100. The **machine-gun squad** consists of the squad leader (a 2 p. o.) and 7 men, as in an infantry squad. The front rank retains the numbers 1, 2, 3, 4; the rear rank is renumbered 5, 6, 7, and 8, respectively. The squad leader becomes **gun captain**. Numbers 1, 2, and 3 constitute the gun crew, and become, respectively, the **pointer, first loader,** and **second loader.** Numbers 5, 6, 7, and 8 constitute the support, and assist in transporting the gun and its equipment, spare parts, ammunition, etc., according to the type of gun and the equipment supplied, and in providing ammunition in action.

2101. **Machine-gun companies,** etc., have an organization similar to that of corresponding infantry units. Thus the machine-gun **platoon** consists of not less than 2, nor more than 4, machine-gun squads; and the machine-gun **company** of not less than 2, nor more than 4, platoons.

At least three officers are necessary for each machine-gun company and, if practicable, there should be, in addition to the company commander, a junior officer for each platoon.

2102. When machine-gun squads are attached to infantry companies, their post in line is 5 paces in rear of the line of file closers; in column, 2 paces in rear of the rear guide. They take no part in infantry drills as machine-gun units.

2103. Machine-gun companies and other separate detachments are posted as prescribed in article 1697.

2104. When present at ceremonies, machine-gun companies participate in the same manner as artillery companies, so far as is consistent with the nature of their equipment. Machine-gun squads attached to infantry companies are normally either temporarily combined into machine-gun detachments, or become infantry squads of their own companies.

General Rules.

2105. The movements, signals, formations, and general rules for infantry apply to machine-gun units, so far as is consistent with the nature of their equipment, and except where otherwise provided or obviously inappropriate.

2106. When machine-gun squads are attached to infantry or artillery companies, they will conform to the spirit of such command as may be given for the company, without awaiting the specific commands applicable only to machine-gun units.

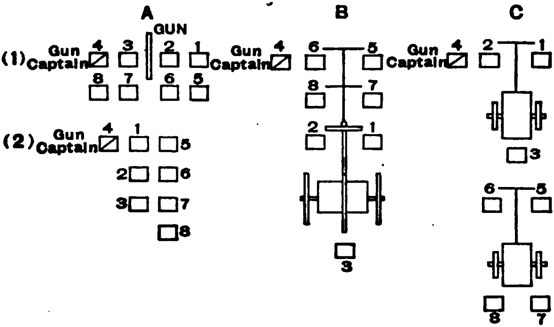


FIG. 164.

Formations.

2107. In the formation **squad to the front**, whatever the type of gun, the squad is formed as an infantry squad, facing to the front, 1 pace to the right of the gun, where there is no cart or carriage; or 1 pace to the right of the drag ropes or leading cart pole, as the case may be. This formation is similar to **platoon to the front**, in artillery.

2108. The **marching formation** depends on the type of gun, and is shown in Figure 164.

The gun, tripod, etc., if carried by the squad, are laid on the ground in the most convenient manner when at a halt, and except at ceremonies need not have the exact position as shown in the figure.

2109. For the formation **in battery**, the gun, mounted and cleared for action, is pointed in the designated direction; the gun captain takes post near the gun ready to supervise its fire; No. 1 is at the shoulder piece; Nos. 2 and 3 in position for performing their duties, according to the type of gun; the other members of the squad have stations as directed. All take cover, so far as practicable. The gun carts, if provided, are in designated locations, under cover if practicable.

2110. The above formations apply to the squad, whether attached to infantry and artillery companies or part of machine gun companies.

The distance and interval between successive guns, when in the **marching formation** or **squads to the front**, is as may be appropriate for the type of gun and equipment supplied. When **in battery**, the interval is as directed in the order for taking that formation.

To Prepare for Action.

2111. The command is: 1. **Action front (right, left, rear)**, 2. **MARCH**, in the same manner as for artillery, and may be used for individual guns or larger units. When the machine guns are mounted on carriages, or where otherwise appropriate, as for example when they are attached to an artillery company, the commands **in battery, in battery action front (right, rear, left)**, etc., may also be used. When attached to infantry companies, machine guns will prepare for action, on command of the squad leader, immediately on arriving at the position designated by the c. c. as the one to be occupied.

To Prepare for the March.

2112. Being **in battery**, each squad takes the **marching formation** at the command **PREPARE FOR TRANSPORT**. Where appropriate, the command **MAN THE DRAG** may also be used, as for artillery. Each squad having taken the marching formation, the squads are assembled by appropriate commands, as for a line of infantry squads in extended order. If attached to infantry companies, machine gun squads **prepare for transport** at the order to assemble given to the company as a whole, after which they assemble as indicated.

2113. In an attack, to advance the guns or to advance by rushes, the sights are laid down at the preparatory command for the advance. The gun is set at safety (for Marlin, Colt, or similar type guns, cartridges must be withdrawn from the chamber). The pointer and first loader on either side pick up the gun and tripod without dismounting it, and carry it as directed. Other members of the squad follow with ammunition, etc.

To Take Position.

2114. Infantry commands are used when appropriate. The following additional commands may be used: 1. **Line of squads,** 2. **on first (or other) squad,** 3. **Interval, 50 (or so many) yards,** 4. **MARCH.**

1. **Form echelon,** 2. **on first (or other) squad,** 3. **To the left (right) rear (front),** 4. **Interval (so and so),** 5. **Distance (so and so),** 6. **MARCH.**

Sec. II.—CONTROL OF FIRE.

2115. The light Browning clip holds 20 rounds; the Benet clip, 30 rounds; the Lewis magazine, 47 rounds; the Colt, Marlin, Browning heavy, and Vickers belts hold 250 rounds each. In any type of machine gun, it is of advantage (except at dense targets at close range—say inside of 200 or 300 yards) to fire **bursts** of 5 to 30 rounds, depending on the conditions; checking the aim between bursts. The increased accuracy and steadiness more than compensate for the few seconds lost.

2116. An understanding of the following definitions is essential:

(1) **Point fire** is more or less sustained fire, keeping the line of sight, as nearly as may be, on the designated aiming point. Point fire is used for **ranging,** also for normal **rapid fire.**

(2) **Effective beaten zone (E. B. Z.)** is the horizontal area within which 75 per cent of the shots, so fired, fall. It is described at any range, by giving its **depth** (measured in the plane of fire) and its **width** (laterally or perpendicular to that plane), for that range.

(3) **Deep fire** is for the purpose of increasing the **depth** of the E. B. Z., where the target covers considerable area, or the range is in doubt.

It includes:

(a) **Vertical searching**, or firing short bursts at ranges increasing or decreasing progressively by small amounts, from one limiting range to the other.

(b) **Bracketing**, where two guns begin, one at the lower limiting range and searching up to the upper limiting range, the other gun starting at the upper range and searching to the lower.

(c) **Combined sights**, where two or more guns fire at the same target with ranges differing by 50 or 100 yards (not more than the depth of the E. B. Z. for the range of target).

(4) **Broad fire** is for the purpose of increasing the width of the E. B. Z., where the target has a broad front. It includes:

(a) **Traversing**, or horizontal sweeping, by firing a small burst at one edge of the target, then shifting the point of aim slightly and firing another burst, and so on until the entire front of the target has been covered.

(b) **Swinging traverse**, which is the same as above, except that the gun is trained laterally during the burst. It is used only on dense targets, at close range.

2117. The following table gives the approximate values of the E. B. Z. under ordinary conditions:

Range.	Vertical diameter of 75 per cent cone of fire.	Depth of E. B. Z.	Horizontal width of E. B. Z.
Yards.	*Feet.*	*Yards.*	*Feet.*
500	5	220	2.5
800	8	170	4
1,000	11	140	5
1,200	13.5	112	7
1,500	16	75	10
2,000	33	70	20

2118. To secure effect on the target by point fire, the error in range should not be greater than one-half the depth of the E. B. Z. for that range.

Fire Discipline and Fire Commands.

2119. The commands are given in the following order:

1. Designation of gun, or guns (if necessary).
2. Range or ranges.
3. Designation of target.

4. Kind of fire (and number of rounds or clips, etc., if desired).
5. The order to fire.

2120. **Ranging fire** (one gun).—Thus:

1. **Right (or other) gun.**
2. **Range 700.**
3. **At the (hedge in front).**
4. **Ranging fire.**
5. **COMMENCE FIRING.**

Used for observation purposes. Applied in bursts of 10 to 20 rounds (bursts must not be too small). Limit of effective observation is about 800 yards.

2121. **Rapid fire** (one gun or more).—Thus:

1. **(Both guns.)**
2. **Range 1,200.**
3. **At the** (**so and so**).
4. **Rapid fire.**
5. **COMMENCE FIRING.**

This is the normal fire of machine guns. Applied in bursts of 20 to 30 rounds. Check aim after each burst unless effect can be seen, or against dense targets at close range.

2122. **Vertical searching** (one gun).—Thus:

1. (**Such and such gun.**)
2. **Range 900.**
3. **At the** (**so and so**).
4. **Vertical searching to 1,100.**
5. **COMMENCE FIRING.**

Applied in bursts of 20 to 30 rounds, at ranges increasing by increments of 100 yards after each burst, unless otherwise directed (50 yards if range is over 1200), firing last burst at upper range.

If the gun has an elevating screw, the following method may be used:

The pointer sets the sight at the lower range (900), lays gun on the target, then raises sliding leaf to upper range (1,100); the sight will then be directed at a point about 200 yards in front of the target. The pointer then fires bursts, turning the elevating wheel slightly between bursts, until the sights are again directed on the target.

2123. **Bracketing** (two guns).—Thus:

1. (**Such and such guns.**)
2. **Bracketing, right gun 800, left gun 1200.**
3. **At the** (**so and so**).
4. **Rapid fire (or so many rounds, etc.).**
5. **COMMENCE FIRING.**

Applied in bursts of 20 to 30 rounds. The right gun searches from 800 up to 1200; the left gun from 1200 down to 800.

2124. Combined sights (two guns or more).—Thus:

1. **(Such and such guns.)**
2. **Combined sights, right gun 900, left gun 1000.** (Or **right gun 900, increase by 100.**)
3. **At the (so and so).**
4. **Rapid fire** (or **so many rounds, etc.**).
5. **COMMENCE FIRING.**

Applied in bursts of 20 to 30 rounds, each gun using the same point of aim.

2125. Traversing (one gun or more).—Thus:

1. **(Such and such guns.)**
2. **Range 900.**
3. **At (hedge in front) (from —— to ——).**
4. **Traversing (with 2 guns, outward (inward) traversing).**
5. **COMMENCE FIRING.**

Applied in short bursts (5 to 10 rounds), traversing slightly between bursts, until the entire front has been covered. With two guns, one starts at the right edge of the target and sweeps to the left edge; one at the left edge and sweeps to the right edge.

2126. Swinging traverse (one gun or more).—Thus:

1. **(Such and such guns).**
2. **Range 200.**
3. **At (advancing enemy).**
4. **Swinging traverse.**
.5 **COMMENCE FIRING.**

Applied in bursts of 20 to 30 rounds, unless target is very dense and close. The gun is trained laterally during the burst.

2127. SUSPEND FIRING. Fire is stopped and gun is set at safety, but all is left in readiness to continue the fire without change if the command **commence firing** is given.

2128. CEASE FIRING. Fire is stopped, sights laid down, and the gun unloaded.

Sec. III.—CONDUCT OF FIRE.

2129. In determining the method of fire, the following points must be considered:

(1) **The probable error in the range.**—The amount of ground to be searched is **twice the probable error.** Thus, with a possible 15

per cent error at a range of 1000 yards, the depth to be searched will be 300 yards.

(2) **The number of guns available.**—If three guns are available, they can cover this depth (300 yards) with combined sights, 100-yard differences. If only two guns are available, the method of bracketing may be used. If only one is available, the method of vertical searching must be used.

2130. Combined sights are normally not necessary up to 800 yards. From 800 to 1200 yards, inclusive, use 100-yard differences; over 1200 yards use 50-yard differences. When using combined sights by guns in pairs, have 100-yard differences between pairs.

2131. Bracketing fire has been much used by the Germans in the European War. It has a great moral effect, but is wasteful of ammunition.

Auxiliary Aiming Points.

2132. If the target is poorly defined or difficult to describe, an auxiliary aiming point above or below the target may often be chosen, the shots being brought on the target by changing the sight elevation. This may be accomplished by several methods to be described; the principles involved are identical.

2133. Graticule method.—This is the easiest method. A graticule scale is necessary, which may be readily constructed as follows:

(1) Make a scale on a piece of cardboard or tin, with lines on it marked in the same manner, and at the same distance apart, as the 100-yard intervals on the rear sight. The scale so marked is used inverted, hence the figures must be made so as to be read that way (see Fig. 165).

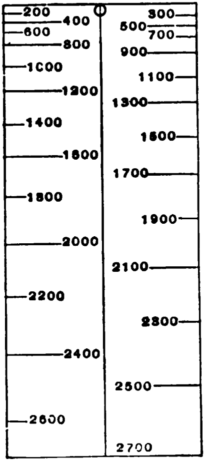


FIG. 165.

(2) Measure the distance from front torear sight of the gun. This is the distance at which the card must be held from the eye, and a knotted string will make it easy to get the distance correct.

(3) If, as is likely to be the case, the distance between sights is greater than the distance the graticule card can conveniently be held away from the eye, the distance may be reduced as convenient,

2142. To determine whether or not the trajectory will clear a mask between the gun and target: Lay the gun to hit the target. Without disturbing the laying of the piece, reset the sight to the range of the mask. The sheaf of fire will clear only if the line of sight clears.

2143. **Overhead fire** (firing over friendly troops) has also limited application, and unless very carefully used is dangerous. The angle of safety is 1° (18 mils) plus one-half the 100 per cent zone, up to 2,000 yards. For this purpose the 100 per cent zone may be taken as three times the 75 per cent zone (see art. 828), and unless the gun is fired from a very steady platform the dispersion will be considerably more and is also increased by any deterioration of rifling or by warping due to heat.

When the friendly troops are more than 2,000 yards away, overhead fire should never be used.

Range Cards.

2144. Machine-gun fire is often ineffective, due to an incorrect determination of the range.

Range cards show the targets and registration marks with the range of each from the machine-gun position, and are of great assistance in reducing the errors and enabling the guns to materially increase the effectiveness of their fire.

2145. There are two kinds of range cards, namely, **attack cards and defense cards**.

(1) The **attack card** is made as follows: A base line is drawn to represent the frontage. From this base line a line is drawn at each side toward the position of the enemy. On these two side lines are marked the ranges in yards; ranges on one side being from the enemy's position; on the other side, from our own. In the range card for attack (see fig. 166) the ranges between those given can be estimated from those shown.

(2) The **defense card**. This card has no definite frontage. The first thing to do is to fix the point from which the ranges are taken; this point is then joined to the most prominent object in front. These two points are then joined by a *heavy* line (called the **setting ray**). The object of this heavy line is to enable the fire-unit commander to properly set the card so as to correspond with the country.

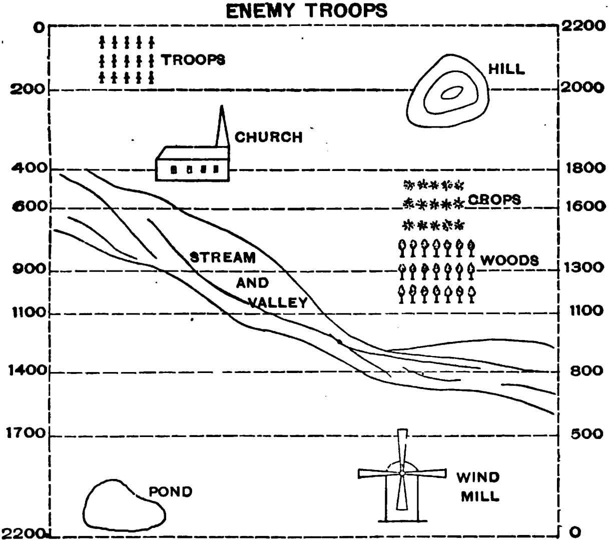
The other objects on which ranges are to be given are joined to the observation point by the thin lines on which are marked the range, also prominent objects or descriptive points. (See fig. 167.)

It is very important when making this card to clearly locate the observation point.

Choice of Positions.

2146. A good position has:

1. Clear field of fire for 100 or 200 yards.
2. Good facilities for observation and fire control.



ATTACK CARD

FIG. 166.

3. Concealment, especially from enemy's artillery.
4. Covered approach and line for advance or retreat.
5. Facilities for ammunition supply.
6. Good footing (on soft ground use sandbags, brush, or logs).

2147. In addition to the above points, the following should be considered:

1. Enfilade fire against enemy, and from enemy's guns against our own.
2. Possibility of long range covering fire, to support our own troops.
3. Fire against houses, etc., in rear of enemy's line, and against likely places for enemy's machine guns.
4. Alternative positions, in case the first position should be located by enemy's artillery.

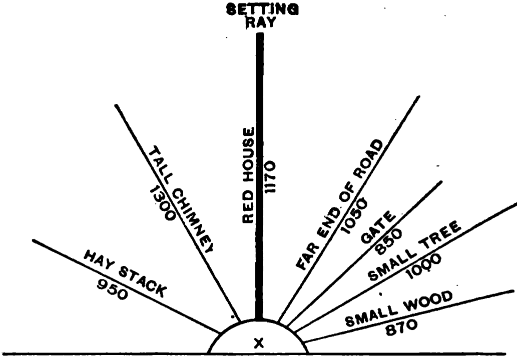


FIG. 167.

2148. In choosing a position **avoid:**

1. Obvious positions.
2. Positions easy to describe, or to range upon, both from maps and from surroundings.
3. Ground which will facilitate observation by enemy of their fire against our guns.
4. Positions near prominent objects or aiming points.

2149. For **concealment** make use of background; use gun masks, grass, crops, branches, etc.; avoid movement between or around guns.

Sec. IV.—TACTICAL USE OF MACHINE GUNS.

Machine Guns in Attack.

2150. The machine guns of an attacking force are used to support the advance of the infantry to an assault position, in one or more of the following ways:

(1) **Fire from the flanks.**—In every attack, flanks of certain elements get in the air (i. e., unprotected) on account of that element's having made greater progress than the troops on the right or left. Machine guns are very useful to protect these flanks against counterattacks, and also to assist the troops held up, by covering their front.

(2) **Long range covering fire.**—Is most valuable and every opportunity for its use should be seized. Suitable ground, buildings, etc., should be looked for, and covering fire given our infantry to the last practical moment.

(3) **Long range searching fire.**—The enemy's machine guns are the most likely weapons to hold up the attack. Therefore, every effort should be made to locate them, and to concentrate the fire of our own guns upon them. It may sometimes be possible to use machine guns to systematically search places likely to be held by the enemy, by using indirect fire. This searching fire has great moral effect on troops subject to it. It requires, however, a large expenditure of ammunition, and favorable ground is necessary.

(4) **Fire from a forward position.**—If guns are pushed forward, the ground must be carefully reconnoitered beforehand. There is no use in adopting this method unless concealment is possible for the guns and ammunition supply.

(5) **Securing positions won.**—Important tactical points taken by advance of infantry should be made good by guns, and if the advance is checked, guns should be dug in or otherwise protected.

(6) **Guns in infantry line.**—The gun squads advancing in line must be extended to resemble the infantry, guns and tripods separated. If bunched they become a certain target for the enemy's machine guns. The Germans are so impressed with the importance of machine-gun fire, that they concentrate great volumes of fire on every point where the presence of the guns is suspected.

(7) **Organization for attack.**—The greater portion of guns available should be organized in order to work together and give the maximum

effect, and the plans of the infantry commander should be understood as thoroughly as possible by the machine-gun officer.

(8) **Oblique and enfilade fire.**—It is of great advantage to secure a position from which a section of the enemy's line may be enfiladed. **The fire of guns should be crossed so that oblique effects are obtained. Oblique fire is more effective than direct fire.** If the enemy's line is gained and he is forced out of his position, machine guns must pursue him with fire as long as possible and try to complete his defeat. They should also secure for themselves favorable positions to help in repulsing a counterattack should one be launched.

Machine Guns in Defense.

2151. (1) **Open fighting.**—Machine guns assisting a force to hold up the enemy's advance should be placed in commanding positions where their fire will not be masked; salients should be chosen and their fire organized so as to sweep the whole front.

(2) **Concealment.**—Guns must be placed so as to make it difficult for the enemy to locate them, and only the numbers 1 and 2 should be at the gun. There should be no unnecessary movement which would enable enemy's field glasses to locate positions.

(3) **Alternative positions.**—Each gun should have an alternative position in view which can be reached without exposure. Sometimes if the enemy searches round your position with artillery he can be induced to imagine he has routed you if you cease firing. It is well not to be too optimistic about this. **It is better to move.**

(4) **Ammunition.**—Ammunition must be brought to the guns under cover, and the supply must be ample for all requirements; gun crews being careful to reserve their fire except when necessary to check the advance.

(5) **Fire signals.**—The control of guns in action at close range is most difficult. Guns are usually placed 50 yards apart if working in groups, and men must be trained to recognize at once a few simple signals from the officer in charge; otherwise it is necessary to pass verbal orders, and messengers passing to the guns may give away the position. This last method also causes delays. (See art. 1466.)

(6) **Protection.**—Without interfering with the field of fire, guns may be protected as much as possible, either by artificial methods or by the nature of the ground. Cover from view is good, but cover from fire should be obtained also.

(7) **Reserves.**—Guns dug in lose to a more or less extent their mobility. Therefore it is not advisable to place all in position before

action is opened. A wise commander keeps a reserve which can quickly be brought into play to support threatened sections of his line, or to replace guns put out of action by breakdown or the enemy's fire.

(8) **Detached posts.**—It is sometimes necessary to occupy a position at some distance from the defensive line, in order to cover dead ground, a bridge, road, defile, or spot from which the gun might be enfiladed by the enemy's machine guns. Such a position is very dangerous unless the post can be supported by fire from the main position, but the machine gun is much better than infantry, owing to the small space it occupies and its large volume of fire.

(9) **Rear guard actions.**—A machine gun properly handled can greatly help the retirement of its own troops; successive positions may be selected and the enemy's advance delayed time after time. The moral effect of running into a zone of machine-gun fire is very great. If the lesson is repeated, the pursuit is apt to slacken, as all the ground must be thoroughly reconnoitered to prevent further surprise. Roads may be made quite impassable and the enemy forced to deploy.

Machine Guns with the Landing Force.

2152. For landing operations and expeditionary duty opposition by well-trained and well-organized troops is not likely to be encountered. Machine guns, however, are very useful under the following conditions:

1. For use as boat guns in covering a landing, where covering fire is impracticable from the ships.
2. For clearing the streets in street fighting.
3. For the defense of a small town or village held as a base by small columns operating in hostile territory.
4. For use by small mobile detachments operating independently against hostile forces somewhat superior in strength.

The use of machine guns in irregular operations and minor warfare produces a profound moral effect on the enemy. Their use reduces the amount of resistance offered and shortens its duration.

Notes on Machine-Gun Fire.

2153. 1. Fire may be employed up to 2,500 yards, if the target is worth the expenditure of ammunition. For extreme ranges the tripod mount is necessary.

2. **Enfilading fire is particularly advantageous.**

3. Oblique fire delivered at an angle of 45° increases the effect 30 per cent.

4. A skirmish line with wide intervals is a poor target, but may be reached with some effect by oblique fire.

5. Any target compactly presented, such as reenforced lines, supports, reserves, etc., is a good target.

6. Machine guns should not be substituted for artillery.

7. In exceptional cases only should machine guns be grouped, as in such formations they are particularly vulnerable to artillery fire.

CHAPTER VII.

CEREMONIES AND INSPECTIONS.

Sec. I.—CEREMONIES.

General Rules.

2154. When forming for ceremonies, the companies of the battalion and the battalions of the regiment are posted from right to left in line and from head to rear in column, in the order of rank of their respective commanders, the senior on the right or at the head, unless otherwise directed by the proper commanding officer.

The commander faces the command; subordinate commanders face to the front.

2155. At the command **present arms**, given by the commanding officer of the troops, his staff salutes; the bn. c's. staff salutes at the bn. c's. command; other staffs salute with their commanders; the rg. s. c. salutes with rg. c. staff.

2156. At the **assembly** for a ceremony, companies are formed on their own parades and informally inspected.

At **adjutant's call**, except for ceremonies involving a single battalion, each battalion is formed on its own parade, reports are received, and the battalion presented to its commander. At the second sounding of **adjutant's call**, the regiment is formed.

2157. Formations for ceremonies may be modified to suit the ground.

2158. The formations of the machine-gun and supply companies (when formed with guns, carts, and transportation) are as follows (figs. 137, 168, and 169):

Regiment.	Machine-gun company.	Supply company.
Line of masses	Line	Formed in depth of 3 wagons.
Column of masses		
Column of battalion close lines	Close line	Formed on frontage of 6 wagons.
Line of battalion columns	Close column	Formed in depth of 6 wagons.
Line of battalions in column of company close lines.	Column of squads.	Formed on frontage of 3 wagons.

The formation of one-pounder and light-mortar units with guns and ammunition carts is similar to that shown for a machine-gun platoon. In ceremonies involving more than one regiment, they are attached to the machine-gun company and formed as an additional platoon or platoons; the remainder of the headquarters company (less band, noncommissioned staff, and mounted men) is attached to a rifle battalion and formed as an additional company or distributed by platoons to rifle companies as required by the nature of the formation (fig. 169).

When formed without guns, carts, and transportation in regimental ceremonies, the headquarters company (less band, noncommissioned staff, and mounted men), the machine-gun company, and the supply company are formed as prescribed for rifle companies in the positions shown in figure 137: in ceremonies involving more than one regiment they are commanded as a provisional battalion and formed as prescribed for a rifle battalion.

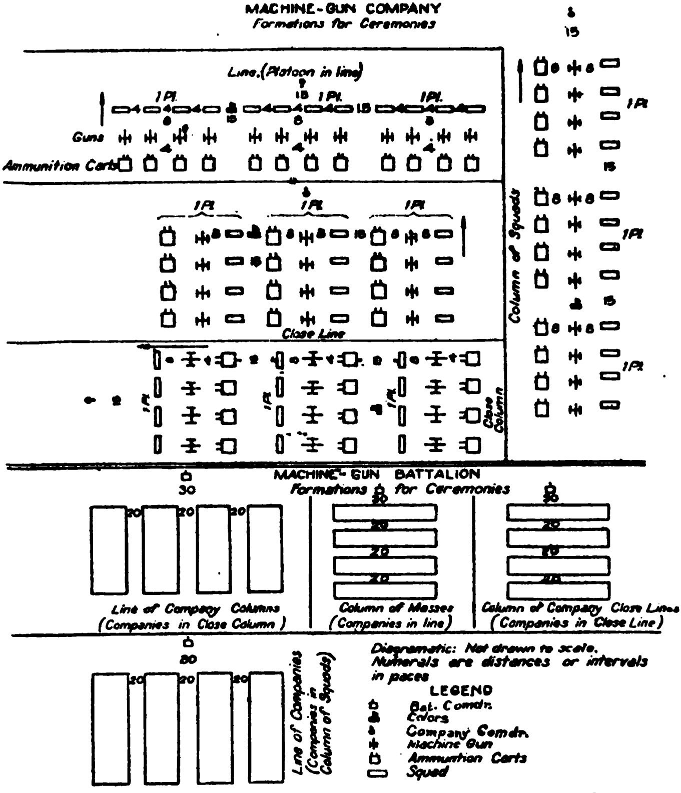
For regimental ceremonies, the supply company, when formed with transportation, is, as nearly as practicable, divided into units of a frontage and depth of 3 wagons. The units are formed with wagons at intervals of 15 paces, and distances of 5 paces.

2159. In commands in which the average strength of companies is less than 9 squads, each unit will adopt the formations prescribed for the next lower unit, i. e., the company will be formed as a platoon, the battalion as a company, etc.

For ceremonies, members of company headquarters detachments are posted in the line of file closers, or formed as an extra squad of a platoon, or used to fill blank files.

2160. When reviewed with infantry regiments, machine-gun battalions with guns and ammunition carts are formed as follows (figs. 168 and 169):

Regiment.	Machine-gun battalion.
Line of battalion columns................	Line of company columns.
Column of masses........................	Column of masses.
Column of battalion close lines............	Column of company close lines.
Line of battalions in column of company close lines.	Line of companies.



Diagramatic: Not drawn to scale.
Numerals are distances or intervals in paces

Note: At the command Squads Right (left) March the carts execute, Carts Right (left)

FIG. 168.

Sec. II.—REVIEWS.

General Rules.

2161. The adjutant posts men or otherwise marks the line of march of the column in such manner that its flank in passing will be about 20 paces from the reviewing officer.

The post of the reviewing officer is indicated by a marker.

Officers of the same grade as the reviewing officer or of higher grade and distinguished personages invited to accompany him place themselves on his left or as otherwise indicated; their staffs and orderlies place themselves respectively on the corresponding side of the staff and the orderlies of the reviewing officer; all others who accompany the reviewing officer place themselves on the left of his staff or as otherwise indicated, their orderlies in rear. A staff officer is designated to escort distinguished personages and to indicate to them their proper positions.

2162. While proceeding around the troops, the reviewing officer may direct that his staff, flag, and orderlies remain at the post of the reviewing officer, or that only his personal staff and flag accompany him; in either case the commanding officer alone accompanies the reviewing officer. While passing around the troops, the commanding officer proceeds on the flank of the reviewing officer away from the command. If the reviewing officer is accompanied by his entire staff, the staff officers of the commander place themselves on the side of the staff of the reviewing officer corresponding to the position of the commander.

The reviewing officers and others at the reviewing stand salute the color as it passes; when passing around the troops the reviewing officer and those accompanying him salute the color when passing in front of it.

The reviewing officer returns the salute of the commanding officor of the troops only. Those who accompany the reviewing officer de not salute.

2163. In passing in review each staff salutes with its commander.

2164. After saluting the reviewing officer in passing in review, the commanding officer of the troops turns out of the column and takes post on the side of the reviewing officer toward the direction of march of the command; the members of his staff accompanying him take post on the corresponding side of the reviewing officer's staff. When the rear element of his command has passed, the commanding officer of the troops, without changing his position, salutes the reviewing officer; he and the members of his staff accompanying him then rejoin the command. The commanding officer of the troops and the members of his staff are the only ones who turn out of the column and take post at the side of the reviewing officer.

2165. If the person reviewing the command is not mounted, the commanding officer and his staff, on turning out of the column after passing the reviewing officer, dismount preparatory to taking post. In such case the salute of the commanding officer, prior to rejoining his command, is made with the hand before remounting.

2166. When the rank of the reviewing officer entitles him to the honor, each regimental color salutes at the command **present arms,** given or repeated by the commander of the battalion with which it is posted, and again in passing in review.

2167. The band of an organization plays while the reviewing officer is passing in front and in rear of the organization.

During the march in review each band turns out of the column, takes post as hereinafter prescribed or as otherwise directed, continues to play until its regiment has passed, then ceases playing and follows in rear of its regiment; the band of the following regiment commences to play as soon as the preceding band has ceased.

While marching in review, but one band in each brigade plays at a time, and but one band at a time when within 100 paces of the reviewing officer.

In large commands bands may be massed and posted as directed by the commanding officer.

2168. If the rank of the reviewing officer entitles him to the honor, the band plays the prescribed national air or the field music sounds **to the color, march, flourishes,** or **ruffles** when arms are presented. When passing in review, at the moment the regimental color salutes the musicians posted with the band sound **to the color, march, flourishes,** or **ruffles.**

2169. The **present arms** and the ride around the line by the reviewing officer may be dispensed with.

2170. Troops march in review with the guide toward the flank on which the reviewing officer is posted.

2171. Troops pass in review in quick time only.

2172. In reviews of regiments or larger commands each battalion and special unit, after the rear has passed the reviewing officer 50 paces, takes the double time for 100 yards in order not to interfere with the march of the column in rear; if necessary it then turns out of the column and returns to quarters by the most practicable route.

When review is to be followed by muster or inspection, units reform in their original places or as otherwise directed, after passing in review.

2173. In a brigade or larger review a regimental commander may cause his regiment to stand **at ease, rest,** or **stack arms,** and **fall out** and **resume attention,** so as not to interfere with the ceremony.

2174. When an organization is to be reviewed before an inspector junior in rank to the commanding officer, the commanding officer receives the review and is accompanied by the inspector, who takes post on his left.

2175. The march in review may commence from either flank of the command. When the march is to commence with the left flank, the command should be formed from left to right. The march in review is described in these regulations as commencing with the right flank; appropriate changes in commands and movements are made when the movement is to commence with the left flank.

Battalion Review.

2176. The battalion having been formed in line or in line of close columns, the bn. c. faces to the front; the reviewing officer moves a few paces toward the bn. c. and halts; the bn. c. turns about and commands: 1. **Present,** 2. **ARMS,** and again turns about and salutes.

The reviewing officer returns the salute; the bn. c. turns about, brings the battalion to order arms, and again turns to the front.

The reviewing officer approaches to about 6 paces from the bn. c., the latter salutes, takes post on his right, and accompanies him around the battalion. The band plays. The reviewing officer proceeds to the right of the band, passes in front of the c. c's to the left of the line and returns to the right, passing in rear of the file closers and the band.

On arriving again at the right of the line, the bn. c. salutes and halts, and the reviewing officer with his staff proceeds to his post in front of the center of the battalion. When the reviewing officer and his staff have passed him, the bn. c. moves directly to his post in front of the battalion, faces it, and commands: 1. **Pass in review,** 2. **MARCH.**

At the first command, the band changes direction, if necessary, and halts.

The second command is given when the band has changed direction.

Being in line: At the bn. c's first command, each c. c. commands: **Squads right.** At the bn. c's second command, the band

and the battalion move off, the band playing; without command from the bn. c., the column changes direction at the points indicated, and column of platoons at full distance is formed successively to the left at the second change of direction. C. c's take post 8 paces in front of their leading platoons after the second change of direction.

Being in line of close columns: At the bn. c's first command, the c. c. of the right company commands: **Squads right.** At the bn. c's second command, the band and the right company move off, the band playing; without command from the bn. c., the band changes direction at the points indicated, and the company forms close column at the first change of direction and close line at the second change. The other companies successively execute **squads right** in time to follow the preceding company at 30 paces, form close column to the left, and pass in review in close line.

The bn. c. takes his post 15 paces in front of the band immediately after the second change of direction; the band, having passed the reviewing officer, turns to the left out of the column, takes post in front of and facing the reviewing officer, and remains there until the review terminates.

The bn. c. and staff salute when the bn. c. is 6 paces from the reviewing officer and terminate the salute when the bn. c. has passed 6 paces beyond him (see arts. 2249 and 2272).

If passing in review in column of platoons, each c. c. and the second in command execute and terminate the salute in the same manner and when in the same relative positions with respect to the reviewing officer as prescribed for the bn. c. and his staff. Each platoon leader, without facing about, commands: 1. **Eyes,** in time to add, 2. **RIGHT,** when at 6 paces from the reviewing officer, and commands **FRONT** when at 6 paces beyond him.

If passing in review in close line, all units of the company execute **eyes right** and **front** at the command of the c. c.; each c. c. commands: 1. **Eyes,** in time to add, 2. **RIGHT,** when at 6 paces from the reviewing officer, and **FRONT,** when 20 paces beyond him (arts. 2248 and 2272).

Staff petty officers and the drum major execute and terminate the salute at the points prescribed for the bn. c. Guides charged with the step, trace, and direction do not execute **eyes right.**

If the reviewing officer is entitled to a salute from the colors, the battalion color salutes when at 6 paces from him and is raised when at 6 paces beyond him.

review. Only the commanding officer of the troops and battalion commanders give the command **present arms.** Brigade and regimental commanders and their staffs salute as soon as their last battalions have been presented.

2184. One of the following formations for review of brigades and larger commands will be adopted whenever practicable:

Formation A: Line of battalion columns (see fig. 137, paragraphs 2158 and 2160, and fig. 169).

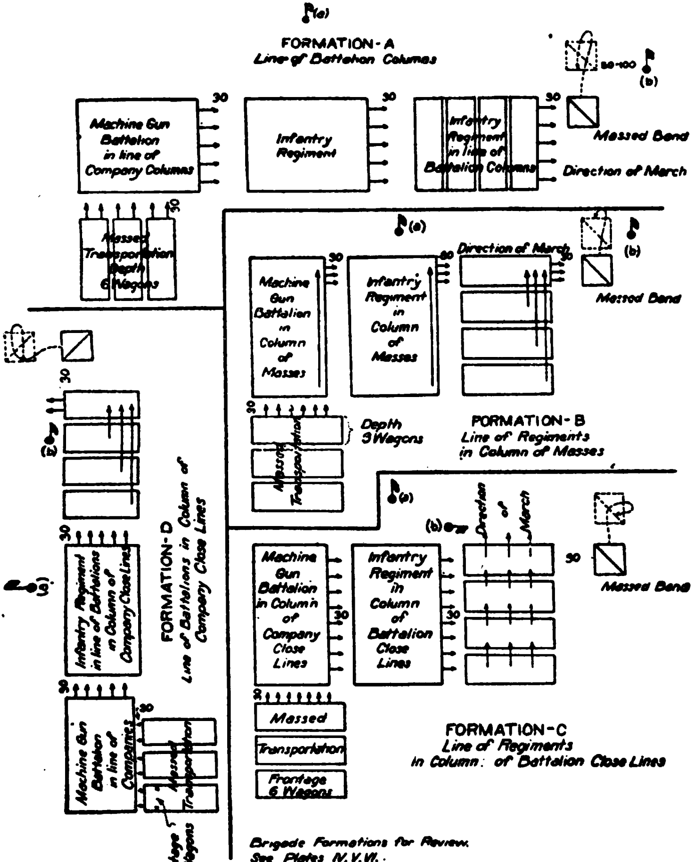
The reviewing officer receives the present at (*a*) (fig. 169). After passing around the command, he takes post at (*b*). The commanding officer of the troops commands: **Pass in review.** The band moves forward playing, countermarches, and takes post 50–100 paces to the right of the reviewing officer. The commander of the right battalion commands: 1. **Squads right,** 2. **MARCH,** and moves his battalion directly by the flank in close line with guide left. The other battalions and the machine-gun company of the right regiment move successively by the flank in time to follow the preceding battalion in close line at 30 paces. The right battalion of each succeeding regiment and the right company of the machine-gun battalion move by the flank in time to follow the preceding unit in close line at 60 paces. The other rifle battalions and machine-gun companies move successively by the flank and follow the preceding unit in close line at a distance of 30 paces. The transportation moves forward in time to march by the flank and follow the rear of the column as soon as the ground in its front has been cleared.

Eyes left is executed at the command of rifle battalion and machine-gun company commanders.

This formation and procedure in passing in review may be adopted when there is sufficient space on the flank of the command to permit the leading units to clear the field without blocking the march of those in rear.

Formation B: Line of regiments in column of masses.

Posts of the reviewing officer and band as in Formation A. At the command: **Pass in review,** the commander of the leading battalion of the right regiment commands: 1. **Squads right,** 2. **MARCH,** and moves his battalion directly by the flank in column of close lines. The other battalions and the machine-gun company of the right regiment move successively forward in time to march by the flank and follow the preceding battalion at 30 paces. The leading battalion of each succeeding regiment and the leading company of the machine-gun battalion move by the flank in time to follow the


(a)
FORMATION-A
Line of Battalion Columns
Machine Gun Battalion in line of Company Columns
30
Infantry Regiment
30
Infantry Regiment in line of Battalion Columns
30
50-100
(b)
Massed Band
Direction of March
Massed Transportation Depth 6 Wagons
30
(a)
(b)
Direction of March
30
30
30
Massed Band
Machine Gun Battalion in Column of Masses
Infantry Regiment in Column of Masses
30
Massed Transportation
Depth 3 Wagons
FORMATION-B
Line of Regiments in Column of Masses
(b)
(a)
(b)
Direction of March
30
Massed Band
Machine Gun Battalion in Column of Company Close Lines
30
Infantry Regiment in Column of Battalion Close Lines
30
30
Massed
Transportation
Frontage 6 Wagons
FORMATION-C
Line of Regiments in Column: of Battalion Close Lines
30
(b)
30
(a)
Infantry Regiment in line of Battalions in Column of Company Close Lines
FORMATION-D
Line of Battalions in Column of Company Close Lines
30
Machine Gun Battalion in line of Companies
30
Massed Transportation
Frontage 3 Wagons

Brigade Formations for Review.
See Plates IV, V, VI.
Diagramatic: Not drawn to scale.
Reviewing Officers Post

FIG. 169.

preceding unit at 60 paces. Other rifle battalions and machine-gun companies move successively forward in time to march by the flank and follow the preceding unit at 30 paces. The leading unit of the massed transportation moves forward in time to march by the flank and follow the preceding unit at 60 paces. Rearward transportation units move successively forward in time to move by the flank and follow the preceding unit as soon as the latter has cleared its front.

Eyes left is executed at the command of commanders of rifle companies and leaders of one-pounder, light-mortar, and machine-gun platoons.

This formation and procedure in passing in review may be employed when troops are to march by the flank in review and there is not sufficient space for the use of Formation A; it may also be employed when the march past is to take place without change of post of the reviewing officer, the leading battalion of the right regiment moving straight to the front and then by the flank so as to pass the reviewing post in column of close lines, other battalions, machine-gun companies, and transportation units following the leading battalion as already described.

Formation C: line of regiments in column of battalion close lines.

The reviewing officer receives the present at (*a*) (Fig. 169). After passing around the command, he takes post at (*b*). The commanding officer of the troops commands: **Pass in review**. The commander of the leading battalion of the right regiment commands: 1. **Forward**, 2. **MARCH**, 3. **Guide left**, and marches his battalion in review in close line. The band moves out playing with the leading battalion, changes direction to the right when opposite the reviewing officer, countermarches, and takes post facing him. Other battalions and the machine-gun company of the right regiment move successively forward in time to follow the preceding battalion at 30 paces and pass in review in close line. The leading battalions of other regiments and the leading company of the machine-gun battalion move by the flank in time to march to the front and follow the preceding unit in the same formation as soon as the latter has cleared the front of the formation. Other rifle battalions and machine-gun companies move successively by the flank in time to march to the front and follow the preceding unit at 30 paces, and pass in review in close line. The massed transportation moves forward as soon as its front has been cleared, marches by the flank when its leading elements have reached the original front of the formation so as to follow the rear of the column, and again moves by the flank so as to pass in review on the same ground as the rifle battalions and machine-gun companies.

Eyes left is executed at the command of rifle-battalion and machine-gun company commanders.

This formation may be employed when there is more suitable ground for passing the command in review to the front of the formation than toward the flank.

Formation D: line of battalions in column of company close lines.

Posts of reviewing officer and band as in Formation C.

The right battalion moves to the front and passes in review in column of close lines. Other battalions and the machine-gun company of the right regiment move successively by the flank and to the front in time to follow the preceding battalion at a distance of 30 paces. The right battalions of other regiments and the right company of the machine-gun battalion move by the flank and to the front in time to follow the preceding unit at 60 paces. The other rifle battalions and machine-gun companies move successively by the flank and to the front in time to follow the preceding unit at 30 paces. The right unit of the massed transportation moves forward as soon as the preceding unit has cleared its front, marches by the flank so as to follow the rear of the column and again moves by the flank so as to pass in review on the same ground as the rifle battalions and machine-gun companies. The other transportation units move successively forward as soon as the tail of the unit on their right has cleared the front on which the transportation was originally formed, march by the flank, and pass in review as prescribed for the right unit.

Eyes left is executed at the command of rifle-company and 1-pounder, light-mortar, and machine-gun platoon commanders.

This formation may be employed when there is not sufficient space for passing the command in review on a battalion front as in formation C.

Formations C and D are especially adapted to the massing of a large command in a very restricted area.

The command may be passed in review by the left flank (formations A and B) or to the front of the left unit (formations C and D) when required by the condition of the ground.

The above formations are described for reference only when required.

Sec. III.—PARADES.

General Rules.

2185. If dismounted, the officer receiving the parade and his staff stand at parade rest, with arms folded, while the band is sounding off; they resume attention with the adjutant. If mounted, they remain at attention.

2186. At the command **report**, given by a battalion adjutant, the c. c's. in succession from the right salute and report: **A** (or **other**) **company, present or accounted for**; or, **A** (or **other**) **company,** (so **many**) **officers or men absent.**

Battalion Parade.

2187. At **adjutant's call,** the battalion is formed in line or line of close columns but is not presented. The bn. c. takes post at a convenient distance in front of the center and facing the battalion.

The adjutant, from his post in front of the center of the battalion, commands: 1. **Parade,** 2. **REST**; the battalion executes **parade rest.** The adjutant directs the band: **SOUND OFF.**

The band, playing in quick time, passes in front of the line of c. c's. to the left of the line and back to its post on the right, when it ceases playing. At evening parade, when the band ceases playing, retreat is sounded by the field music, and following the last note, and while the flag is being lowered, the band plays the **Star-Spangled Banner.**

Just before the last note of retreat, the adjutant comes to attention, and as the last note ends, commands: 1. **Battalion,** 2. **ATTENTION,** 3. **Present,** 4. **ARMS,** and salutes, retaining that position until the last note of the national anthem. He then turns about, salutes, and reports: **Sir, the parade is formed.** The bn. c. directs the adjutant: **Take your post, sir.** The adjutant moves at a trot (if dismounted, in quick time), passes by the bn. c's right, and takes his post.

The bn. c. commands: 1. **Order,** 2. **ARMS,** and adds such exercises in the manual of arms as he may desire. Officers, petty officers commanding platoons or armed with the sword, and the color guard, having once executed order arms, remain in that position during the exercises in the manual.

The bn. c. then directs the adjutant: **Receive the reports, sir.** The adjutant, passing by the bn. c's. right, advances at a trot (if dismounted, in quick time) toward the center of the line, halts midway between it and the bn. c., and commands: **REPORT**.

The reports received, the adjutant turns about, and reports: **Sir, all are present or accounted for**; or **Sir, (so many) officers or men are absent**, including in the list of absentees those from the band and field music reported to him by the drum major prior to the parade.

The bn. c. directs: **Publish the orders, sir.**

The adjutant turns about and commands: **Attention to orders**; he then reads the orders, and commands: 1. **Officers**, 2. **CENTER**, 3. **MARCH**.

At the command **center**, c. c's. face to the center. At the command **march**, they close to the center and face to the front; the adjutant turns about and takes his post.

The c. c's. having closed and faced to the front, the senior commands: 1. **Forward**, 2. **MARCH**. The c. c's. advance, the band playing; the senior c. c. is the guide, and marches on the bn. c.; the c. c's. are halted at 6 paces from the bn.,c. by the senior, who commands: 1. **Officers**, 2. **HALT**. They halt and salute. The bn. c. then gives such instructions as he deems necessary, and commands: 1. **Officers**, 2. **POSTS**, 3. **MARCH**.

At the command **posts**, c. c's. face about.

At the command **march**, they step off with guide as before, and the senior commands: 1. **Officers**, 2. **HALT**, so as to halt 8 paces from the line; he then adds: 1. **Posts**, 2. **MARCH**.

At the command **posts**, c. c's. face outward, and at the command **march**, step off in succession at 4 paces distance, and resume their posts.

The music ceases when the c. c's. have resumed their posts.

The bn. c. then commands: 1. **Pass in review**, 2. **MARCH**.

The battalion marches according to the commands and principles of review; when the last company has passed, the ceremony is concluded.

The band continues to play while the companies are in march upon the parade ground. After passing in review, companies are marched to their respective parades by their c. c's.

When the c. c's. have saluted the bn. c., he may direct them to form line with staff, in which case they move individually to the front, passing to the right and left of the bn. c. and staff, halt on the line established by the staff, face about, and stand at attention. The music ceases when the c. c's. join the staff. The bn. c. causes the companies to pass in review under the command of the seconds in command by the same commands as before.

Regimental Parade.

2188. The regiment is formed in line of masses.

The parade proceeds as for the battalion, with the following exceptions:

"Rg. c." is substituted for "bn. c.," "regiment" for "battalion" in the description, and "battalions" for "battalion" in the commands.

The battalions execute **present arms, order arms, parade rest,** and **come to attention** at the command of execution of their commanders, successively from the center battalion.

Exercises in the manual of arms and reports are omitted.

After publishing the orders, the adjutant commands: 1. **Officers, center,** 2. **MARCH.**

Company commanders remain at their posts with their companies.

The field and staff officers form one line, closing on the center. The senior commands: 1. **Forward,** 2. **MARCH.** The senior battalion commander is the guide and marches on the regimental commander.

After being dismissed, each battalion commander moves individually to the front, turns outward, and followed by his staff, resumes his post by the most direct line.

The regimental commander gives the necessary commands, orders, or signals for marching the regiment in review. The regiment marches according to principles of review.

Street Parades.

2189. Street parades are ordinarily commanded by a person who is designated as "grand marshal." He appoints a chief of staff and aids, and issues a general order giving all necessary directions for the formation, movement, and dismissal of the parade.

2190. This order includes:

1st. The names of his staff officers, and when and where they are to report to him.

2d. The assignment of organizations and their order in brigades and divisions, and the names and assignment of bg. cs. and marshals of divisions.

3d. The streets upon which the different brigades and divisions form, the direction in which their lines face, where the right rests, and the size of the front of subdivision in column.

4th. The time for each division to complete its formation and stand ready to march.

5th. The time at and place from which the head of the parade will move, and the line of march and the direction of the guide.

6th. Honors to be paid by the troops during the march.

7th. Instructions for the dismissal of the parade.

8th. Instructions regarding uniform.

2191. The order of precedence in parade is as follows:

1. The Regualr Army.
2. United States Marines.
3. United States Naval Forces.
4. United States Volunteers.
5. Organized Militia, including Naval Reserves.
6. Military organizations, uniformed and armed, not included above.
7. Military societies.
8. Uniformed organizations of the United States and municipalities.
9. Civic societies.

2192. When cadets from the U. S. Military Academy or Midshipmen of the U. S. Naval Academy are present (as distinct organizations) it is customary to give them the right of the line in the order named.

2193. The grand marshal marches at the head of the parade; his staff, chief of staff on the right, marches 3 paces in his rear in one or more ranks. The grand marshal is usually preceded by mounted police and a platoon of dismounted police who clear the way. The marshal of the first division marches 24 paces in rear of the staff of the grand marshal. All other officers take post as prescribed in Figs. 137, 168 and 169.

2194. Odd-numbered divisions are ordinarily formed in streets to the right of the line of march, the first division nearest the starting point, lines facing opposite the direction of the march, rights resting on the line of march. Even-numbered divisions are similarly formed on the streets to the left. Their lines face in the direction of the march, rights resting on the line of march. The march may be in column of companies, platoons, or squads.

2195. If the side streets are too narrow to allow the designated formation, divisions march out on the line of march in column of squads and form column of platoons, or companies front into line at double time.

2196. The grand marshal may review the parade, just prior to its dismissal, at some designated point beyond the reviewing stand.

Sec. IV.—PRESENTATION OF DECORATIONS.

2197. When practicable, a review will be held on occasion of the presentation of the medal of honor, the distinguished service cross, the distinguished service medal, or the decoration of the colors.

The persons to receive the award assemble in single rank in front of the center of the command on line with the company commanders; colors to be decorated take post 5 paces in front of the center of the line of persons. After the reviewing officer has ridden around the line and resumed his post in front of the center of the command the persons and colors to be decorated are marched in line to a point 12 paces from the reviewing officer by the commanding officer of the troops. The colors not to be decorated follow the center of the line of the persons to be decorated. The commanding officer of the troops advances toward the reviewing officer, salutes, and reports: **Sir, the persons to be decorated are present.** The reviewing officer returns the salute and directs that the command be presented. The band then plays the **Star Spangled Banner**, or if only field music is present, **To the Colors** is sounded. On completion of the music, the commanding officer of the troops brings the command to order arms. The persons to be decorated and the colors salute and terminate the salute at the commands **present arms** and **order arms**, respectively, of the commanding officer of the troops.

A designated staff officer then reads the order announcing the awards. After the reading of the order, the reviewing officer, accompanied if necessary by his staff or designated members thereof, advances toward the colors and the line of persons to be decorated and fastens the appropriate streamer to the staff of the color, and pins the decoration awarded on the left breast of each person. He then directs the commanding officer of the troops to march the command in review and resumes his post. The persons decorated then form line on the left of reviewing officer or as otherwise directed, and the colors return to their post.

Sec. V.—ESCORTS.

Escort of the Color.

2198. The regiment being in line of masses, the rg. c. details a company, other than the color company, to receive and escort the national color to its place. During the ceremony, the regimental color remains with the color guard at its post with the regiment.

The band moves straight to its front until clear of the line of field officers, changes direction to the right, and is halted; the designated company forms column of platoons in rear of the band, the color bearer in the line of file closers of the center platoon.

The escort then marches without music to the rg. c. office or quarters and is formed in line facing the entrance, the band on the right.

The color bearer, preceded by the senior pt. c. and followed by a p. o. of the escort, then goes to obtain the color.

When the color bearer comes out, followed by the pt. c. and p. o., he halts before the entrance, facing the escort; the pt. c. places himself on the right, the p. o. on the left of the color bearer; the escort presents arms, and the field music sounds **to the color**; the pt. c. and the p. o. salute.

Arms are brought to the order; the pt. c. and the p. o. return to their posts; the company is formed in column of platoons, the band taking post in front of the column; the color bearer places himself in the center of the interval in rear of the center platoon; the escort marches in quick time, with guide left, back to the regiment, the band playing; the march is so conducted that the escort arrives at 50 paces in front of the right of the regiment, marching parallel to its front; when the color arrives opposite its place in the formation of the regiment, the escort is formed in line to the left; the color bearer, passing between the platoons, advances and halts 12 paces in front of the rg. c.

The color bearer having halted, the rg. c., who has taken post 30 paces in front of the center of his regiment, faces about, commands: **Present arms**, faces to the front, and salutes; the field music sounds **to the color.**

The rg. c. then faces about and brings the regiment to the order; the color bearer then takes his post with the color company.

The escort **presents arms** and comes to **the order** with the regiment, at the command of the rg. c. after which the c. c. forms it again in column of platoons, and preceded by the band, marches it to its place, passing around the left flank of the regiment.

The band plays until the escort passes the left of the line, when it ceases playing and returns to its post on the right, passing in rear of the regiment.

The regiment may be brought to rest when the escort passes the left of the line.

2199. Escort of the color is executed by a battalion according to the same principles.

Escorts of Honor.

2200. Escorts of honor are detailed for the purpose of receiving and escorting personages of high rank, civil or military. The troops detailed for this duty are selected for their soldierly appearance and superior discipline.

The escort forms in line, opposite the place where the personage is to present himself, the band on the flank of the escort toward which it is to march. On the appearance of the personage, the honors due to his rank are rendered. The escort then forms column of platoons or squads and takes up the march, the personage with his staff or retinue taking position in rear of the column; when he leaves the escort, line is formed, and the same honors are rendered as on his arrival.

When the position of the escort is at a considerable distance from the point where the personage is to be received, as for instance, where a courtyard or wharf intervenes, a double line of sentinels is posted from that point to the escort, facing inward; the sentinels successively salute as he passes and are then relieved and join the escort.

An officer is designated to attend the personage and bear such communication as he may have to make to the commander of the escort.

Funeral Escort.

2201. The composition and strength of the escort are prescribed in the U. S. Navy Regulations, par. 1301 (2).

The escort is formed opposite the quarters of the deceased, the band on the flank of the escort toward which it is to march.

Upon the appearance of the coffin, the commander commands; 1. **Present,** 2. **ARMS,** and the band plays an appropriate air; arms are then brought to the order.

The escort then forms column of platoons or squads; escorts of the strength of a platoon or less may form line. The procession forms in the following order:

1. **Band,** 2. **Escort,** 3. **Clergy,** 4. **Body and pallbearers,** 5. **Body bearers,** 6. **Mourners:** (a) Enlisted men; (b) Officers from ship of deceased; (c) Other officers; (d) Foreign officers. 7. **Distinguished persons,** 8. **Delegations,** 9. **Societies,** 10. **Citizens.** Officers and enlisted men with side arms, are in the order of rank, seniors in front.

When the procession has been formed, the commander of the escort puts it in march.

The escort marches slowly to solemn music; when the column arrives opposite the grave, line is formed facing it.

The coffin is then carried along the front of the escort to the grave; arms are presented, and the music plays an appropriate air; when the coffin has been placed over the grave, the music ceases, and arms are brought to the order.

The commander next commands: 1. **Parade,** 2. **REST.** The escort executes **parade rest,** officers and men inclining the head.

When the funeral services are completed and the coffin lowered into the grave, the commander causes the escort to resume attention and fire three rounds of blank cartridges, elevating the muzzles of the pieces. When the escort is larger than a company, one company is designated to fire the volleys.

A musician then sounds taps.

The escort is then formed into column, marched in quick time to the point where it was assembled, and dismissed.

The band does not play until it has left the inclosure.

When the distance to the place of interment is considerable, the escort, after leaving the naval station may march **at ease** in quick time until it approaches the burial ground, when it is brought to attention. The music does not play while marching **at ease.**

The field music may alternate with the band in playing.

2202. At the funeral of a person entitled to the honor, the band plays the prescribed **national air,** or the field music sounds **to the color, march,** flourishes, or ruffles, according to the rank of the deceased, when arms are presented; on conclusion of the musical honors, the band plays an appropriate air.

2203. Should the entrance of the cemetery prevent the hearse from accompanying the escort to the grave, the column is halted at the entrance long enough to take the coffin from the hearse, when it is again put in march.

2204. When necessary to escort the remains from the quarters of the deceased to the church before the funeral service, arms are presented upon receiving the remains at the quarters and also as they are borne into the church.

2205. Prior to the funeral, the commander of the escort gives the clergyman and pallbearers all needful directions.

Sec. VI.—INSPECTIONS.

Company Inspection.

2206. The company being in column of platoons at full distance, the c. c. commands: 1. **Prepare for inspection**, 2. **MARCH.**

At the first command, each platoon leader commands: **Open ranks.**

At the command **MARCH**, the front rank of each platoon executes right dress; the rear rank and the file closers march backward 4 steps, halt, and execute right dress.

Each platoon leader aligns the front rank, rear rank, and file closers of his platoon, takes post 3 paces in front of the right guide, facing to the left, and commands: **Front**, and faces to the front.

The c. c. then commands: **Rest**, and commencing at the head of the column, makes a minute inspection of the arms, accouterments, dress, and ammunition of the personnel of the several platoons and company headquarters. As he approaches each platoon, its leader faces to the left and commands: 1. **Platoon**, 2. **ATTENTION**, 3. **PREPARE FOR INSPECTION**, and faces to the front; as soon as inspected, he accompanies the c. c.

The inspection is from right to left in front, and from left to right in rear, of each rank and of the line of file closers.

Each man, as the c. c. approaches him, executes **inspection arms**,

The c. c. takes the piece, grasping it with his right hand just above the rear sight (model 1903 rifle) or the lower band (model 1917 rifle), the man dropping his hands. The c. c. inspects the piece, and with the hand and piece in the same position as in receiving it, hands it back to the man, who takes it with the left hand at the balance and executes **order arms**.

Men successively execute **inspection arms**, as the inspecting officer returns the piece to the man on their right.

Should the piece be inspected without handling, each man executes order **arms** as soon as the c. c. passes to the next man.

Enlisted men armed with the pistol execute **inspection pistol** by drawing the pistol from the holster and holding it diagonally across the body, barrel up, and 6 inches in front of the neck, muzzle pointing up, and to the left. The pistol is returned to the holster as soon as the c. c. passes.

Upon completion of the inspection of each platoon, its leader takes post facing to the left, 3 paces in front of the right guide, and commands: 1. **Close ranks**, 2. **MARCH**, and adds **Rest**, after the ranks have been closed.

At the command **MARCH**, the rear rank closes to 40 inches, each man covering his file leader; the file closers close to 2 paces from the rear rank. The platoon leader then resumes his post in front of the center of the platoon.

The company may be inspected in line according to similar principles.

2207. If the company is dismissed, rifles are put away. In quarters, headdress and accouterments are removed, and the men stand near their respective bunks; in camp, they stand covered but without accouterments, in front of their tents.

If the personal field equipment has not been inspected in ranks and its inspection in quarters or camp is ordered, each man arranges the prescribed articles, on his bunk if in quarters or permanent camp, in front of his half of the tent if in shelter-tent camp, in the same relative order as prescribed in article 2211.

The c. c., accompanied by the platoon leaders, then inspects the quarters or camp. The company chief petty officer precedes the c. c. and calls the men to attention on entering each squad room or on approaching the tents; the men stand at attention but do not salute.

Assembling the Pack.

2208. (1) Spread shelter-tent half on the ground with tie-ties up. Lay tie-ties and guy rope across shelter-tent half and fold triangular end over, making it a rectangle.

(2) Spread blanket on shelter half, stripes paralleling ridge, with name down and end bearing name on side of ridge. Fold ends of blanket over so they meet in center. This will make a long pack. For a short pack the blanket ends should overlap, the extreme overlap being 8 inches. Move blanket so that edge rests on ridge, which leaves from 18 to 26 inches of tent exposed at bottom.

(3) Standing at the front end of the tent, ridge on the right, place the clothing in the following order on the left half of the blanket and about 1 foot from the front edge of the tent:

One pair of trousers and one jumper (O. D. shirt), side by side, jumper (O. D. shirt) on the right. On top of the trousers place one pair of drawers; on top of the jumper (O. D. shirt) place one undershirt. Across the clothing place two pairs of socks.

For the navy a white cap and watch cap are added and form the outer layer. The width of the clothing will be the width of the fold of the blanket. Between the clothing and front edge of tent, and close to clothing, place 1 pair of shoes, one sole down, and one sole up, toes overlapping. Shelter-tent pins and pole are placed on blanket at opposite end of and close to clothing. (See Fig. 170).

(4) Fold end of blanket at front of ten over shoes. Then fold right half of blanket over left half, covering clothing. Then take end of blanket farthest away from clothing, fold it over to a line between clothing and shoes. Fold bottom edge of tent over blanket, then fold ridge over this. Fold over about 1 foot of end of tent farthest from clothing to form a pocket. Beginning at front edge, roll compactly into this pocket.

(5) The poncho will be folded to suitable size and carried in haversack on top of rations.

Assembling the Pack Without the Shelter Half.

2209. Without the shelter-half, the pack is similarly assembled with the following modifications:

(1) Spread blanket on the ground, name down, top of blanket on the right. Fold top and bottom of the blanket toward each other until they meet in the center, or overlap, if short pack is desired.

(2) Place clothing as above described, on the near side of the left flap of the blanket, and about 1 foot from its rear edge. Place the shoes as above described, next the clothing and on the near side of the left flap. Fold near side of the blanket over the shoes. Fold right half of the blanket over the left half. Fold far side of the blanket over about 1 foot to form a pocket. Beginning at the clothing end of the pack (near side) roll compactly into the pocket.

The Machete or Wire Cutter.

2210. (1) The machete or wire-cutter will be attached to the belt under the second pocket from the rear of the left pocket-section.

(2) The pistol, when worn, will be attached to the belt under the third pocket from front, in right pocket-section.

Examination of Equipment in Ranks.

2211. If the inspection is to include an examination of the equipment while in ranks, the c. c., after closing ranks, causes the company to stack arms, to march backward until 4 paces in rear of the stacks and to take intervals. He then commands: 1. **UNSLING EQUIPMENT.** 2. **OPEN PACKS.**

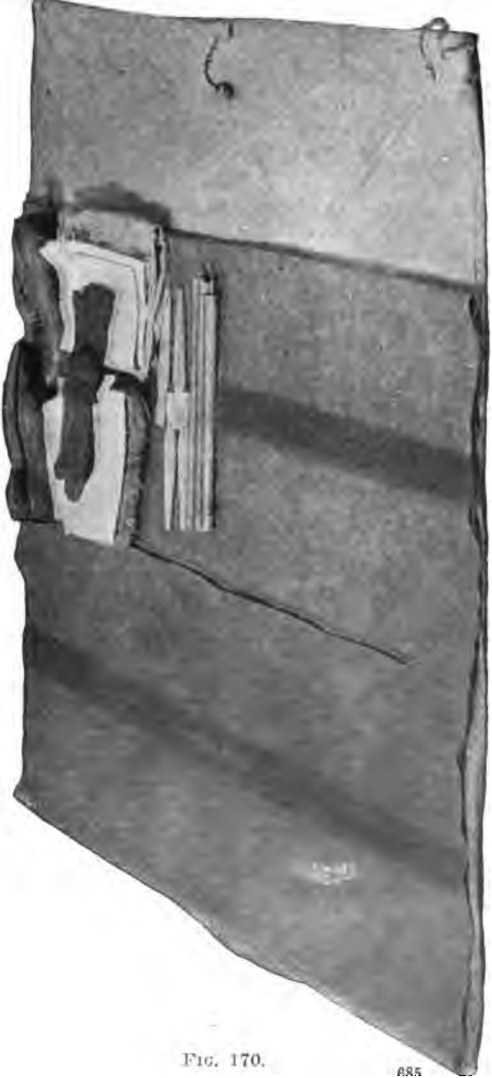


Fig. 170.

At the first command, each man unslings his equipment and places it on the ground at his feet, haversack to the front, end of the pack 1 foot in front of toes.

At the second command, pack carriers are unstrapped, packs removed and unrolled, the longer edge of the pack along the lower edge of the cartridge belt.

Each man unfolds blanket so as to expose contents of pack; removes meat can, knife, fork, and spoon from the meat-can pouch, and places them on the blanket in front of the shelter-tent pins, in following order from rear to front: Meat can, cover, knife on sheath, fork on sheath, spoon, first-aid kit, canteen (on right), cup (on left); draws bayonet, places it on blanket to left of meat can and cover, hilt to front; unstraps and spreads out haversack so as to expose its contents; folds up pack carrier so that it rests on edge of blanket, opens haversack, folds up inside flap of haversack so that its edge is on line with pack carrier; places folded poncho over haversack flap so that its longer edge is on a line with pack carrier; places bacon and condiment cans (former on left, top off) on top of poncho; unrolls towel, exposing toilet articles, the towel resting on haversack in front of poncho; removes intrenching tool from carrier and places over outer haversack flap. Each man then resumes the position of attention. Figure 171 shows the relative position of all articles, except special articles.

The c. c. then passes along the ranks and file closers as before, inspects the equipment, returns to his position in front of the center of the leading platoon, and commands: **CLOSE PACKS**.

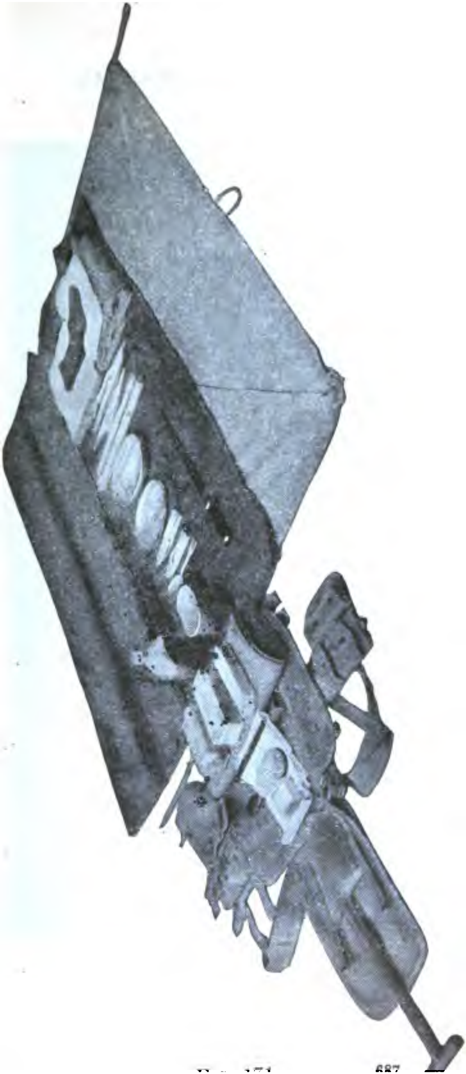
Each man rolls up his toilet articles and underwear, straps up his haversack and its contents, replaces the meat can, knife, fork, and spoon, and the canteen and cup; closes cartridge pockets and first-aid pouch; restores special articles to their proper receptacles; rolls up and replaces pack in carrier; and leaving the equipment in its position on the ground, resumes the attention.

All equipments being packed, the c. c. commands: **SLING EQUIPMENT**.

The equipments are slung, and belts fastened.

The c. c. then causes the platoons to assemble and take arms. The inspection is completed as already explained.

2212. The p. o. or enlisted man in charge of company headquarters prepares the detachment for inspection as prescribed for platoon leaders, posting his detachment at ten paces from the rear platoon before opening ranks.



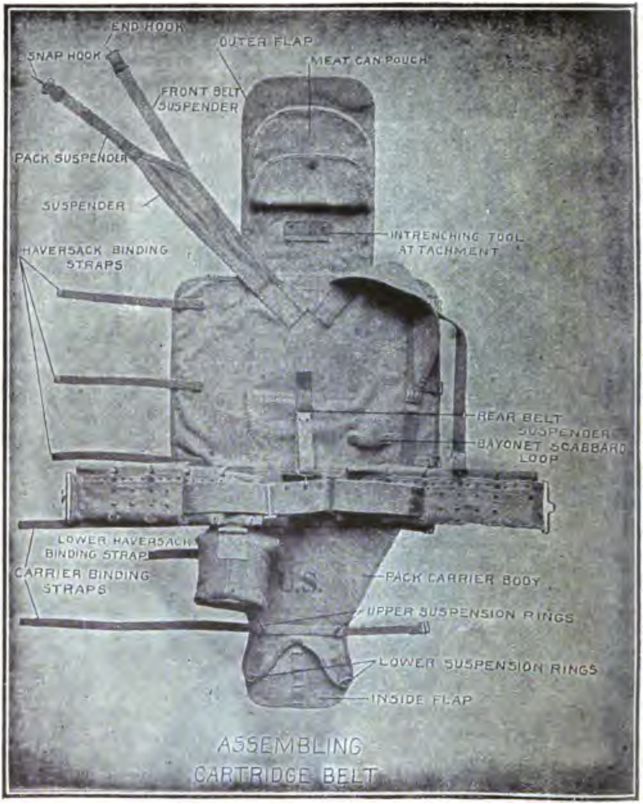

END HOOK
SNAP HOOK
OUTER FLAP
MEAT CAN POUCH
FRONT BELT SUSPENDER
PACK SUSPENDER
SUSPENDER
INTRENCHING TOOL ATTACHMENT
HAVERSACK BINDING STRAPS
REAR BELT SUSPENDER
BAYONET SCABBARD LOOP
LOWER HAVERSACK BINDING STRAP
CARRIER BINDING STRAPS
U.S.
PACK CARRIER BODY
UPPER SUSPENSION RINGS
LOWER SUSPENSION RINGS
INSIDE FLAP
ASSEMBLING CARTRIDGE BELT

FIG. 172.

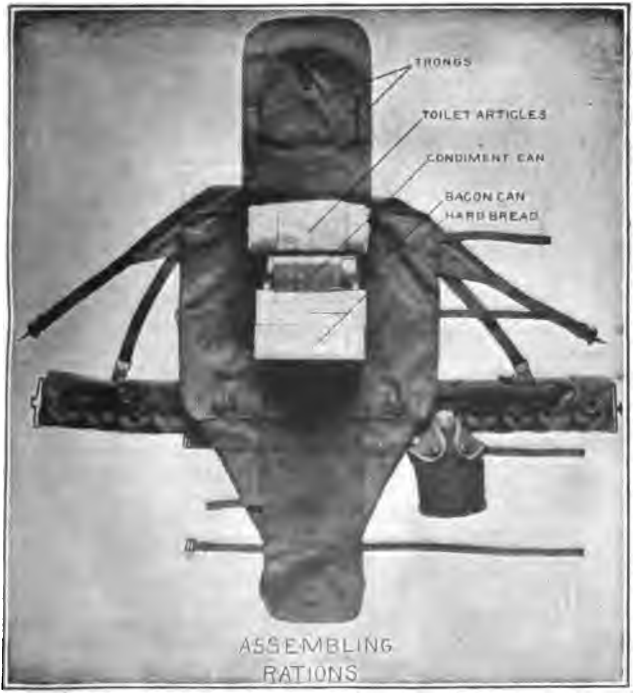

TRONGS
TOILET ARTICLES
CONDIMENT CAN
BACON CAN
HARD BREAD
ASSEMBLING
RATIONS

FIG. 173.

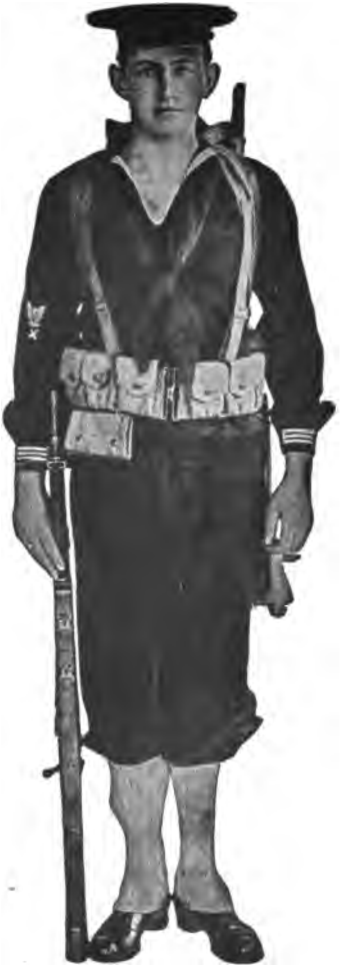


FIG. 174

2213. The c. c. may direct the platoon leaders to make the detailed inspection of the arms, equipment, etc., of the men of their platoons.

The second in command accompanies the c. c. throughout the inspection or makes such part of the inspection as the c. c. may direct.

2214. Should tne inspector be other than the c. c., the latter, after commanding **REST**, faces to the front. When the inspector approaches, the c. c. faces about, brings the company to attention, faces to the front, and salutes. As soon as inspected, he faces about, commands: **REST**, and accompanies the inspector. The inspection proceeds as before.

Battalion Inspection.

2215. If the formation is to include both inspection and review, the inspection may either precede or follow the review.

The battalion is formed in line of close columns all officers dismounted. The bn. c. causes the companies to extend to full distance; the band, p. o. staff, and colors conform to the movement of the companies.

The bn. c. commands: 1. **Prepare for inspection**, 2. **MARCH**.

At the first command, each c. c. commands: **Open ranks**.

At the command **march**, ranks are opened in each company as in the inspection of the company.

Buglers join their companies. The band opens ranks.

The inspector inspects the bn. c. and, accompanied by the latter, inspects the staff officers.

The bn. c. then commands: **REST**, and with his staff accompanies the inspector.

If the bn. c. is the inspector, he commands: **REST**, and inspects his staff, which then accompanies him.

The inspector, commencing at a flank of the battalion, then makes an inspection of the arms, accounterments, dress, and ammunition of each enlisted man of the band, the several companies, the color guard, and the p. o. staff.

The adjutant gives the necessary commands for the inspection of the band, the color guard, and the p. o. staff.

When the inspector approaches the band, the adjutant commands: **PREPARE FOR INSPECTION**.

As the inspector approaches him, each man raises his instrument in front of the body, reverses it so as to show both sides, and then returns. it. Buglers execute inspection similarly.

The band plays during the inspection of the companies.

As the inspector approaches each company, its commander commands: 1. **Company**, 2. **ATTENTION**, and faces to the front; as soon as inspected, he faces about, commands: **REST**, and accompanies the inspector. The inspection proceeds as in company inspection. At the completion of the inspection

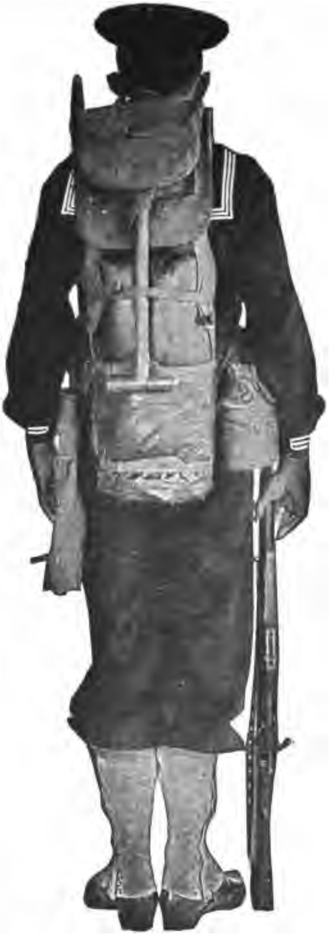


FIG. 175.

of the petty officers staff and each company, the battalion commander directs their dismissal, unless otherwise directed by the inspector.

2216. If the inspection will probably last a long time, the companies not under inspection may be permitted to stack arms and fall out; as the inspection of the preceding company nears completion, they fall in and take arms.

2317. At the inspection of quarters or camp, the inspector is accompanied by the c. c., followed by the other officers or by such of them as he may designate. The inspection is conducted as described in company inspection.

Regimental Inspection.

2218. The commands, means, and principles are the same as described for a battalion.

The regiment is formed in line of masses or such other suitable formation as required by the ground and the space available.

Before opening ranks, companies are extended to full distance.

On the approach of the inspector, each bn. c. brings his battalion to attention. Battalion inspection follows. Inspection of special units follows that of the battalions.

Sec. VII.—MUSTER.

2219. The company is formed for muster in line or close column. The c. c. is provided with the roll of company and a list of absentees, alphabetically arranged, showing cause and place of absence.

As the mustering officer approaches, the c. c. salutes. The mustering officer returns the salute and directs the captain to prepare his company for muster. The c. c. commands: 1. **Right shoulder,** 2. **ARMS**, 3. **Attention to muster.**

The mustering officer or the c. c. then calls the names on the roll; each man as his name is called answers **here** and brings his piece to **order arms.**

After muster the mustering officer verifies the presence of men reported in hospital, on guard, etc.

Muster is so conducted as to interfere as little as possible with the instruction of the troops.

Sec. VIII.—GUARD MOUNTING.

2220. Guard mounting will be formal or informal as the commanding officer may direct.

Formal Guard Mounting.

2221. Formal guard mounting will ordinarily be held only in posts or camps where a band is present.

2222. At the **assembly**, the men designated for the guard fall in on their company parade grounds as prescribed in Art. 1529. The c. p. o. then verifies the detail, inspects it, replaces any man unfit to go on guard, turns the detail over to the senior p. o., and retires. The band takes its place on the parade ground so that the left of its front rank shall be 12 paces to the right of the front rank of the guard when the latter is formed.

2223. At **adjutant's call**, the adjutant, dismounted, with the bn. c. p. o. on his left, marches to the parade ground. The adjutant halts and takes post so as to be 12 paces in front of and facing the center of the guard when formed; the bn. c. p. o. continues on, moves by the left flank, and takes post, facing to the left, 12 paces to the left of the front rank of the band; the band plays in quick or double time; the details are marched to the parade ground by the senior p. os.; the detail that arrives first is marched to the line so that, upon halting, the breast of the front-rank man shall be near to and opposite the left arm of the bn. c. p. o.; the commander of the detail halts his detail, places himself in front of and facing the bn. c. p. o., at a distance equal to or a little greater than the front of his detail, and commands: 1. **Right**, 2. **DRESS**. The detail dresses up to the line of the bn. c. p. o. and its commander, the right front-rank man placing his breast against the left arm of the bn. c. p. o.; the p. os. take post two paces in rear of the rear rank of the detail. The detail aligned, the commander of the detail commands: **FRONT**, salutes, and then reports: "**The detail is correct**;" or " (**So many p. os. or men are absent**;" the bn. c. p. o. returns the salute after the report is made; the commander then passes by the right of the guard and takes post in the line of p. os. in rear of the right file of his detail.

Should there be more than one detail, it is formed in like manner on the left of the one preceding; the men, p. os., and commander of each detail dress on those of the preceding details in the same rank or line; each detail commander closes the rear rank to the right and fills blank files, as far as practicable, with the men from his front rank.

Should the guard from a company not include a p. o., one will be detailed to perform the duties of commander of the detail. In this case the commander of the detail, after reporting to the bn. c. p. o., passes around the right flank between the guard and the band and retires.

2224. When the last detail has formed, the bn. c. p. o. takes a side step to the right, draws sword, verifies the detail, takes post 2 paces to the right and 2 paces to the front of the guard, facing to the left, causes the guard to count off, completes the left squad, if necessary, as in the School of the Company, and, if there be more than three squads, divides the guard into two platoons, again takes post as described above, and commands: 1. **Open ranks**, 2. **MARCH**.

At the command **march**, the rear rank and file closers march backward 4 steps, halt, and dress to the right. The bn. c. p. o. aligns the ranks and file closers and again taking post as described above, commands: **FRONT**, moves parallel to the front rank until opposite the center, turns to the right, halts midway to the adjutant, salutes, and reports: "**Sir, the details are correct**;" or, "**Sir, (so many) p. os. or p. os. and men are absent**;" the adjutant returns the salute, directs the bn. c. p. o.: **Take your post**, and then draws sword; the bn. c. p. o. faces about, approaches to within 2 paces of the center of the front rank, turns to the right, moves 3 paces beyond the left of the front rank, turns to the left, halts on the line of the front rank, faces about, and brings his sword to the order. When the bn. c. p. o. has reported, the officer of the guard takes post, facing to the front, 3 paces in front of the center of the guard, and draws sword.

The adjutant then commands: 1. **Officer (or officers) and p. os.**, 2. **Front and center**, 3. **MARCH**.

At the command **center**, the officers carry sword. At the command **march**, the officer advances and halts 3 paces from the adjutant, remaining at the carry; the p. os. pass by the flanks, along the front, and form in order of rank from right to left, 3 paces in rear of the officer, remaining at the right shoulder; if there is no officer of the guard the p. os. halt on a line 3 paces from the adjutant; the adjutant then assigns the officers and p. os. according to rank, as follows: **Commander of the guard, leader of first platoon, leader of second platoon, right guide of first platoon, left guide of second platoon, left guide of first platoon, right guide of second platoon**, and **file closers**; or, if the guard is not divided into platoons: **Commander of the guard, right guide, left guide, and file closers.**

The adjutant then commands: 1. **Officer (or officers) and p. os.**, 2. **POSTS**, 3. **MARCH**.

At the command **posts**, all, except the officer commanding the guard, face about. At the command **march**, they take posts prescribed for the inspection of a company with open ranks (Art. 2206). The adjutant directs: **Inspect your guard, Sir**; at which the officer commanding the guard faces about, commands: **PREPARE FOR INSPECTION**, returns sword, and inspects the guard.

During the inspection, the band plays; the adjutant returns sword, observes the general condition of the guard, and causes to fall out any man who is unfit for guard duty or does not present a creditable appearance. Substitutes will report to the commander of the guard at the guardhouse.

2225. The adjutant, when so directed, selects orderlies and color sentinels, as prescribed in Art. 208, and notifies the commander of the guard of his selection.

2226. If there be a junior officer of the guard he takes post at the same time as the senior, facing to the front, 3 paces in front of the center of the first platoon; in going to the front and center he follows and takes position on the left of the senior and is assigned as leader of the first platoon; he may be directed by the commander of the guard to assist in inspecting the guard.

If there be no officer of the guard, the adjutant inspects the guard. A p. o. commanding the guard takes post on the right of the right guide, when the guard is in line; and takes the post of the officer of the guard, when in column or passing in review.

2227. The inspection ended, the adjutant places himself about 30 paces in front of and facing the center of the guard, and draws sword; the new officer of the day takes post in front of and facing the guard, about 30 paces from the adjutant; the old officer of the day takes post 3 paces to the right of and 1 pace to the rear of the new officer of the day; the officer of the guard takes post 3 paces in front of its center, draws sword with the adjutant and comes to the order; thereafter he takes the same relative positions as the c. c. of a company.

The adjutant then commands: 1. **Parade**, 2. **REST**, 3. **SOUND OFF**, and comes to the order and parade rest.

The band, playing, passes in front of the officer of the guard to the left of the line, and back to its post on the right, when it ceases playing.

The adjutant then comes to attention, carries sword, and commands: 1. **Guard**, 2. **ATTENTION**, 3. **Close ranks**, 4. **MARCH**.

The ranks are opened and closed as in article 2198.

The adjutant then commands: 1. **Present**, 2. **ARMS**, faces toward the new officer of the day, salutes, and then reports: **Sir, the guard is formed.** The new officer of the day, after the adjutant has reported, returns the salute with the hand and directs the adjutant: **March the guard in review, Sir.**

The adjutant carries sword, faces about, brings the guard to an order, and commands: 1. **At trail, platoons** (or **guard**) **right,** 2. **MARCH**, 3. **Guard**, 4. **HALT**.

The platoons execute the movement; the band turns to the right and places itself 12 paces in front of the first platoon.

The adjutant places himself 6 paces from the flank and abreast of the commander of the guard; the bn. c. p. o., 6 paces from the left flank of the second platoon.

The adjutant then commands: 1. **Pass in review**, 2. **FORWARD**, 3. **MARCH**.

The guard marches in quick time past the officer of the day, according to the principles of review, and is brought to **eyes right** at the proper time by the commander of the guard; the adjutant, commander of the guard, leaders of platoons, bn. c. p. o., and drum major salute.

The band, having passed the officer of the day, turns to the left out of the column, places itself opposite and facing him, and continues to play until the guard leaves the parade ground. The field music detaches itself from the band when the latter turns out of the column, and, remaining in front of the guard, commences to play when the band ceases.

Having passed 12 paces beyond the officer of the day the adjutant halts; the bn. c. p. o. halts abreast of the adjutant and 1 pace to his left; they then return sword, salute, and retire; the commander of the guard then commands: 1. **Platoons, right by squads**, 2. **MARCH**, and marches the guard to its post.

The officers of the day face toward each other and salute; the old officer of the day turns over the orders to the new officer of the day.

While the band is sounding off, and while the guard is marching in review, the officers of the day stand at parade rest with arms folded. They take this position when the adjutant comes to parade rest, resume the attention with him, again take the parade rest at the first note of the march in review, and resume attention as the head of the column approaches.

The new officer of the day returns the salute of the commander of the guard and the adjutant, making one salute with the hand.

2228. If the guard be not divided into platoons, the adjutant commands: 1. **At trail, guard right,** 2. **MARCH**, 3. **Guard**, 4. **HALT**, and it passes in review as above; the commander of the guard is 3 paces in front of its center; the adjutant places himself

6 paces from the left flank and abreast of the commander of the guard; the bn. c. p. o. covers the adjutant on a line with the front rank.

Informal Guard Mounting.

2229. Informal guard mounting will be held on the parade ground of the organization from which the guard is detailed. If it is detailed from more than one organization, then at such place as the commanding officer may direct.

2230. At **assembly**, the detail for guard falls in on the company parade ground. The c. p. o. verifies the detail, inspects their dress and general appearance, and replaces any man unfit to march on guard. He then turns the detail over to the commander of the guard and retires.

2231. At **adjutant's call**, the officer of the day takes his place 15 paces in front of the center of the guard and commands: 1. **Officer** (or **officers**) **and p. os.**, 2. **Front and center**, 3. **MARCH**; whereupon the officers and p. os. take their positions, are assigned and sent to their posts as prescribed in formal guard mounting. (Art. 2224.)

The officer of the day will then inspect the guard with especial reference to its fitness for the duty for which it is detailed, and will select as prescribed in article 208 the necessary orderlies and color sentinels. The men found unfit for guard will be returned to quarters and will be replaced by others found to be suitable, if available in the company. If none are available in the company, the fact will be reported to the adjutant immediately after guard mounting.

When the inspection shall have been completed, the officer of the day resumes his position and directs the commander of the guard to march the guard to its post.

Relieving the Old Guard.

2232. As the new guard approaches the guardhouse, the old guard is formed in line, with its field music 3 paces to its right; and when the field music at the head of the new guard arrives opposite its left, the commander of the new guard commands: 1. **Eyes**, 2. **RIGHT**; the commander of the old guard commands: 1. **Present**, 2. **ARMS**; commanders of both guards salute. The new guard marches in quick time past the old guard.

When the commander of the new guard is opposite the field music of the old guard, he commands: **FRONT**; the commander of the old guard commands: 1. **Order,** 2. **ARMS,** as soon as the new guard shall have cleared the old guard.

The field music having marched 3 paces beyond the field music of the old guard, changes direction to the right, and, followed by the guard, changes direction to the left when on a line with the old guard; the changes of direction are without command. The commander of the guard halts on the line of the front rank of the old guard, allows his guard to march past him, and when its rear approaches forms it in line to the left, establishes the left guide 3 paces to the right of the field music of the old guard, and on a line with the front rank, and then dresses his guard to the left; the field music of the new guard is 3 paces to the right of its front rank.

2233. The new guard being dressed, the commander of each guard, in front of and facing its center, commands: 1. **Present,** 2. **ARMS,** and resumes his front, salutes, carries sword, faces his guard, and commands: 1. **Order,** 2. **ARMS.**

Should a guard be commanded by a p. o., he stands on the right or left of the front rank, according as he commands the old or new guard, and executes the rifle salute.

2234. After the new guard arrives at its post, and has saluted the old guard, each guard is presented by its commander to its officer of the day; if there be but one officer of the day present, or if one officer acts in the capacity of old and new officer of the day, each guard is presented to him by its commander.

2235. If other persons entitled to a salute approach, each commander of the guard will bring his own guard to attention if not already at attention. The senior commander of the two guards will then command: 1. **Old and new guards,** 2. **Present,** 3. **ARMS.**

The junior officer of the guard will salute at the command: **Present Arms** given by the senior. After the salute has been acknowledged, the senior brings both guards to the order.

2236. After the salutes have been acknowledged by the officers of the day, each guard is brought to an order by its commander; the commander of the new guard then directs the orderly or orderlies to fall out and report, and causes bayonets to be fixed if so ordered by the commanding officer; bayonets will not then be unfixed during the tour except in route marches while the guard is actually marching, or when specially directed by the commanding officer.

The commander of the new guard then causes to fall out members of the guard for detached posts, placing them under charge of the proper p. os., divides the guard into three reliefs, **first, second,** and third, from right to left, and directs a list of the guard to be made by reliefs.

2237. The sentinels and detachments of the old guard are at once relieved by members of the new guard; the two guards standing at ease or at rest while these changes are being made. The commander of the old transmits to the commander of the new guard all his orders, instructions, and information concerning the guard and its duties. The commander of the new guard then takes possession of the guardhouse and verifies the articles in charge of the guard.

The sentinels and detachments of the old guard, having been relieved, take post on the left of the old guard. The old commander of the guard then inspects the arms of his guard and causes the detachments to be marched to their respective parades and dismissed.

2238. If considerable time is required to bring in that portion of the old guard still on post, the commanding officer may direct that as soon as the orders and property are turned over to the new guard, the portion of the old guard at the guardhouse may be marched off and dismissed. In such a case, the remaining detachment or detachments of the old guard will be inspected by the commander of the new guard when they reach the guardhouse. He will direct the senior p. o. present to march these detachments off and dismiss them in the prescribed manner.

2239. In bad weather, at night, after long marches, or when the guard is very small, the field music may be dispensed with.

Sec. IX.—HONORS AND SALUTES.

2240. Further rules governing honors, courtesies, etc., are prescribed in the U. S. Navy Regulations.

2241. (1) Salutes are exchanged between officers and enlisted men not in a military formation, nor at drill, work, games, or mess, on every occasion of their meeting, passing near or being addressed, the officer junior in rank or the enlisted man saluting first.

(2) When an officer enters a room where there are several enlisted men, the warning "attention" is given by some one who perceives him, when all rise, uncover, and remain standing at attention until the officer leaves the room or directs otherwise Enlisted men at meals stop eating and remain seated at attention

(3) An enlisted man, if seated, rises on the approach of an officer, faces toward him, stands at attention, and salutes, if covered. If standing, he faces an officer for the same purpose. If the parties

remain in the same place or on the same ground, such compliments need not be repeated. Enlisted men actually at work do not cease work to salute an officer unless addressed by him.

(4) Before addressing an officer, enlisted men execute the prescribed salute with the weapon with which armed, or if unarmed, with the right hand. He salutes after receiving a reply.

(5) In uniform, covered, but not in formation, officers and enlisted men salute military persons as follows: With arms in hand, the salute prescribed for that arm (sentinels on interior guard duty excepted); without arms, the right-hand salute.

(6) In civilian dress, covered, officers and enlisted men salute military persons by executing the right-hand salute.

(7) Officers and enlisted men render the prescribed salutes in a military manner, the officer junior in rank, or the enlisted man, saluting first. When several officers in company are saluted, all entitled to the salute return it.

(8) Except in the field under campaign or simulated campaign conditions, a mounted officer or enlisted man dismounts before addressing a superior not mounted.

(9) A man in formation does not salute when directly addressed, but comes to attention if at rest or at ease.

(10) Saluting distance is that within which recognition is easy. In general, it does not exceed 30 paces.

(11) When an officer entitled to the salute passes in rear of a body of troops, it is brought to attention while he is opposite the post of the commander.

(12) In public conveyances, such as railway trains and street cars, and in public places, such as theaters, honors and personal salutes may be omitted when palpably inappropriate.

(13) Enlisted men at all times and in all situations pay the same compliments to officers of the Army, Navy, Marine Corps, and Volunteers, and to officers of the National Guard as to officers of their own regiment, corps, or arm of service.

(14) Sentinels on post doing interior-guard duty conform to the foregoing principles but salute by presenting arms when armed with the rifle. They do not salute if it interferes with the proper performance of their duties.

2242. (1) Commanders of detachments or other commands salute officers of higher grades by first bringing the unit to attention and then saluting as required by subparagraph (5), paragraph 2241. If the person saluted is of a junior or equal grade, the unit need not be at attention in the exchange of salutes.

(2) If two detachments or other commands meet, their commanders exchange salutes, both commands being at attention.

2243. Salutes and honors, as a rule, are not paid by troops actually engaged in drill, on the march, or in the field under campaign or simulated campaign conditions. Troops on the service of security pay no compliments whatever.

2244. A company in line or close column, or a larger unit in line or line of columns, at a halt (not in the field) and armed with the rifle, is brought to **present arms** before its commander salutes in the following cases: When the National Anthem is played, or when **to the color** is sounded during ceremonies, or when a person is saluted who is its immediate or higher commander or a general officer, or when the national or regimental color is saluted.

2245. At parades and other ceremonies, under arms, the command renders the prescribed salute and remains in the position of salute while the National Anthem is being played; also at retreat and during ceremonies when **to the color** is sounded, if no band is present. If not under arms, units are brought to attention at the first note of the National Anthem or **to the color**, and the salute rendered by the officer or petty officer in command.

2246. Whenever the National Anthem is played at any place where persons belonging to the military service are present, all officers and enlisted men not in formation stand at attention facing toward the music (except at retreat, when they face toward the flag). If in uniform, covered, they salute at the first note of the anthem, retaining the position of salute until the last note of the anthem. If not in uniform, and covered, they uncover at the first note of the anthem, holding the headdress opposite the left shoulder and so remain until its close, except that in inclement weather the headdress may be slightly raised.

The same rules apply when **to the color** is sounded as when the National Anthem is played.

When played by the band, the National Anthem is played through without repetition of any part not required to be repeated to make it complete.

The same marks of respect, prescribed for observance during the playing of the National Anthem of the United States, is shown toward the national anthem of any other country when played upon official occasions.

2247. Officers and enlisted men passing the uncased color render honors as follows: If in uniform, they salute as required by subparagraph (5), paragraph 2241; if in civilian dress and covered, they uncover, holding the headdress opposite the left shoulder with the right hand; if uncovered, they stand at attention facing the colors.

2248. In rendering honors at ceremonies, officers and leaders of platoons and equivalent subdivisions, without arms in hand, execute the first motion of the hand salute at the command **arms** of **present arms** and the command **right** (**left**) of **eyes right** (**left**). They execute the second motion at the command **arms** of **order arms** and at the command **front.** P. o.'s commanding platoons and equivalent subdivisions and armed with the rifle execute **present arms** and **order arms** with their platoons; during exercises in the manual, they remain at order arms; in executing **eyes right** (**left**), they execute the first motion of the rifle salute at the command **right** (**left**) and the second motion at the command **front.** For salutes with the sword, see paragraph 2241.

2249. Officers and p. o.'s saluting individually when passing in review at ceremonies execute **eyes right** (**left**) at the first motion of the hand salute; they return to front when the salute is terminated.

CHAPTER IX.

MANUALS.

Sec.—I. THE COLOR.

2250. The word "color" implies the national color; it includes the regimental color when both are present.

The rules prescribing the colors to be carried by regiments and battalions on all occasions are contained in the U. S. Navy Regulations.

2251. In garrison the colors, when not in use, are kept in the office or the quarters of the rg. c. and are escorted thereto and therefrom by the color guard. In camp the colors, when not in use, are in front of the rg. c. tent. From reveille to retreat, when the weather permits, they are displayed uncased; from retreat to reveille and during inclement weather, they are cased.

Colors are said to be cased when furled and protected by the oilcloth covering.

2252. The regimental color salutes in the ceremony of escort of the color and in rendering honors to an officer entitled to the salute of the color, but in no other case.

If marching, the regimental color salutes when at 6 paces from the officer entitled to the salute, and resumes the carry when 6 paces beyond him.

The national color renders no salute.

The Color Guard.

2253. The color guard consist of two color p. o.'s, who are the color bearers, and two experienced enlisted men selected by the rg. c. The senior color p. o. carries the national color, the junior color p. o., the regimental color. The regimental color, when carried, is always on the left of the national color, in whatever direction they may face.

2254. The color guard is formed and marched in one rank, the color bearers in the center. It is marched in the same manner and by the same commands as a squad, substituting, when necessary, **guard** for **squad.**

2255. When battalions are formed abreast, the color company is the center company of the center battalion. When battalions are disposed one behind the other, the color company is the center company of the leading battalion. The color company of the original formation of the battalion or regiment remains the color company during subsequent movements unless otherwise directed.

2256. The post of the color guard in the several formations of the battalion is as shown in Fig. 136. During movements involving changes of formation, the color guard conforms to the plates and maintains its position with reference to the flank or end of the color company on which it was originally posted in accordance with the principles of paragraph 1435. In all changes of directions at ceremonies, the color guard moves in such manner as not to interfere with the march of units in its rear.

2257. In line (Fig. 131.) the color guard is in the center of the interval on the left of the color company on line with the front rank.

In line of close columns (Fig. 136), the color guard is in the center of the interval on the left of the leading platoon of the color company on line with the front rank.

In close line (Fig. 136), the color guard is in the center of the interval on the left of the color company on line with the leading guides.

When the regiment is formed in line of battalion columns or line of battalions in column of company close lines (Fig. 137) in the ceremonies of large commands, the color guard forms in the center of the interval on the left of the leading company of the center battalion. It rejoins the color company when the regiment changes formation.

2258. When with a battalion that takes the battle formation, the color guard joins the regimental reserve; the reserve commander directs the color guard to join a designated company.

2259. The color guard executes neither loadings nor firings; in rendering honors, it executes all movements in the manual; in drill all movements unless specially excused.

To Receive the Color.

2260. The color guard presents arms on receiving and parting with the color at the command of the senior color p. o. After parting with the color, the color guard is brought to order arms by command of the senior member who is placed as the right man of the guard.

2261 At drills and ceremonies in which the color is to participate, excepting escort of the color, the color is received by the color company prior to the formation of the battalion.

The formation of the color company completed, the c. c. faces to the front; the color guard, conducted by the senior p. o., approaches from the front and halts at a distance of 10 paces from the c. c., who then faces about, brings the company to the present, faces to the front, salutes, again faces about and brings the company to the order. The color guard executes the present and the order with the color company, and is then marched by the color p. o. directly to its post on line with the front rank of the company (in line) or of the leading platoon (close column), 5 paces from the guide of the company or platoon.

2262. When the battalion is dismissed, the color guard escorts the color to the office or quarters of the reg. c.

Manual of the Color.

2263. At the **carry**, the heel of the pike rests in the socket of the sling; the right hand grasps the pike at the height of the shoulder.

At the **order**, the heel of the pike rests on the ground near the right toe, the right hand holding the pike in a vertical position.

At **parade rest**, the heel of the pike is on the ground, as at the **order**; the pike is held with both hands in front of the center of the body, left hand uppermost.

The **order** is resumed at the command **attention**.

The left hand assists the right when necessary.

The **carry** is the habitual position when the troops are at shoulder, port, or trail arms.

The **order** and the **parade rest** are executed with the troops.

The **color salute**: Being at the carry, slip the right hand up the pike to the height of the eye, then lower the pike by straightening the arm to the front.

Sec. II.—THE BAND.

2264. The band is formed in two or more ranks with sufficient intervals between the men and distances between the ranks to permit of the free use of the instruments.

The field music, when united, forms with, and in rear of, the band; when the band is not present, the posts, movements, and duties of the field music are the same as prescribed for the band; when a musician is in charge, his position is on the right of the front rank. When the battalion or regiment turns about by squads, the band executes the countermarch; when the battalion or regiment executes **right, left, or about face**, the band faces in the same manner.

In marching, each rank dresses to the right.

In executing **open ranks**, each rank of the band takes a distance of 3 paces from the rank next in front; the drum major verifies the alignment.

The field music sounds the **march, flourishes**, or **ruffles**, and **to the color** at the signal of the drum major.

2265. The post of the drum major is 3 paces in front of the center of the front rank. He gives the signals or commands for the movements of the band as for a squad, substituting in the commands band for squad.

Signals of the Drum Major.

2266. Preparatory to a signal, the staff is held with the right hand near the head of the staff, hand below the chin, back of the hand to the front, ferrule pointed upward and to the right.

Prepare to play: Face toward the band and extend the right arm to its full length in the direction of the staff. **Play**: Bring the arm back to its original position in front of the body.

Prepare to cease playing: Extend the right arm to its full length in the direction of the staff. **Cease playing**: Bring the arm back to its original position in front of the body.

To march: Turn the wrist and bring the staff to the front, the ferrule pointing upward and to the front; extend the arm to its full length in the direction of the staff.

To halt: Lower the staff into the raised left hand and raise the staff horizontally above the head with both hands, the arms extended; lower the staff with both hands to a horizontal position at the height of the hips.

To countermarch: Face toward the band and give the signal **to march**; each front-rank man to the right of the drum major turns to the right about, each front-rank man to the left turns to the left about; each front-rank man is followed by the men covering him. The drum major passes through the center.

To oblique: Bring the staff to a horizontal position, the head of the staff opposite the neck, the ferrule pointing in the direction the oblique is to be made; extend the arm to its full length in the direction of the staff.

To march by the right flank: Extend the arm to the right, the staff vertical, ferrule upward, back of the hand to the rear.

To march by the left flank: Extend the arm to the left, the staff vertical, ferrule upward, back of the hand to the front.

To diminish front: Let the ferrule fall into the left hand at the height of the eyes, right hand at the height of the hip.

To increase front: Let the ferrule fall into the left hand at the height of the hip, right hand at the height of the neck.

The **march, flourishes**, or **ruffles**: Bring the staff to a vertical position, hand opposite the neck, back of the hand to the front, ferrule pointing down.

To the color: Bring the staff to a horizontal position at the height of the neck, bach of the hand to the rear, ferrule pointing to the left.

When the band is playing in marching, the drum major beats the time with his staff and supports the left hand at the hip, fingers in front, thumb to the rear.

The drum major, with staff in hand, salutes by bringing his staff to a vertical position, head of the staff up and opposite the left shoulder.

At a halt, when the band not playing, the drum major holds his staff with the ferrule touching the ground about 1 inch from the toe of the right foot, at an angle of about 60°, ball pointing upward to the right, right hand grasping staff near the ball, back of the hand to the front; left hand at the hip, fingers in front, thumb to the rear.

Sec. III.—MANUAL OF THE SWORD.

To Draw Sword.

2267. The sword being sheathed: 1. **Draw**, 2. **SWORDS**.

At the first command, grasp the scabbard with the left hand at the upper band, turn the guard to the front, seize the grip with the right hand, and draw the blade six inches out of the scabbard; pressing the scabbard against the thigh with the left hand. At the second command, draw the sword quickly, raising the arm to its full extent, at an angle of about forty-five degrees, the sword in a straight line with the arm, edge down, drop the left hand by the side; after a slight pause bring the back of the blade against the shoulder, the blade vertical, back of the grip to the rear, the arm nearly extended, the thumb and forefinger embracing the lower part of the grip, the thumb against the thigh, the fingers joined under the end of the hilt. This is the position of **carry**.

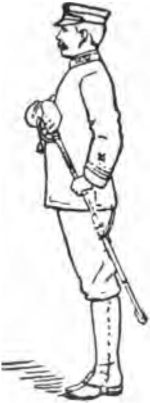


FIG. 176.

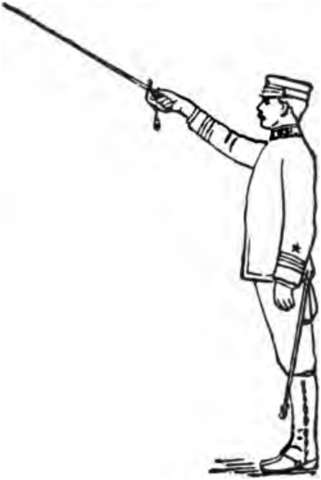


FIG. 177.

The Carry.

2268. The sword will always be brought to the position of **carry** when giving commands to men under arms, at the preparatory command for marching, during alignments, and at the first motion of **about face**.

Mounted Officers.

2269. Mounted officers unhook the sword before mounting, and, in the first motion of **draw swords**, reach with the right hand over the bridle hand, and, without the aid of the bridle hand, draw the sword as before; the right hand, in the position of **carry**, rests on the right thigh.

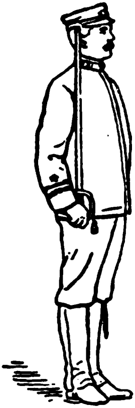


FIG. 178.

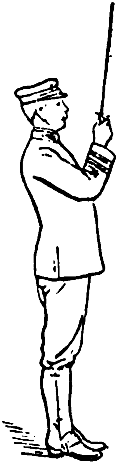


FIG. 179.

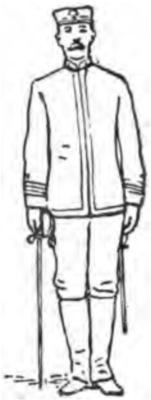


FIG. 180.

The Sword Knot.

2270. (1) When the sword knot is worn, the right wrist may be placed in it before grasping the grip.

(2) When publishing the orders the sword is held suspended from the right wrist by the sword-knot, which may be placed on the wrist before drawing the sword and taken off after returning it.

The Present or Salute.

2271. Being at the carry or order: 1. **Present.** 2. **SWORDS** (or **ARMS**).

At the first command, carry the sword to the front point up, edge to the left, raising the hand as high as the neck, and six inches in front of it, the thumb on the left of the grip, elbow close to the body, the blade inclined slightly to the front. At the second command, drop the point of the sword near the ground by extending the arm, so that the right hand may be brought to the side of the right thigh, the thumb on the left of the grip, the blade inclining downward and to the front, edge to the left.

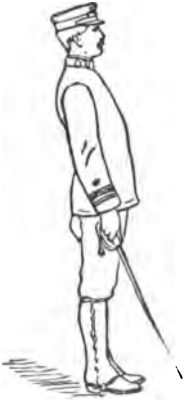


FIG. 181.

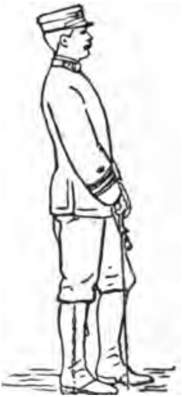


FIG. 182.

The Order.

2272. Being at the carry (or present): 1. **Order.** 2. **SWORDS** (or **ARMS**).

At the second command, drop the point of the sword to the front on the ground, edge down, thumb on the back of the grip, the arm hanging naturally by the side.

Parade Rest.

2273. Being at the order: 1. **Parade,** 2. **REST.**

At the second command, carry the right foot six inches straight to the rear, the left knee slightly bent, clasp the hands on the hilt in front of the center of the body, left hand uppermost, the sword vertical, the point on the ground between the feet, edge to the right.

General Rules.

2274. (1) The sword is held at the **carry** while changing position in quick time.

(2) When at the **order,** swords are brought to the carry when arms are brought to any position except the present or parade rest.

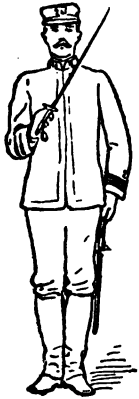


FIG. 183.

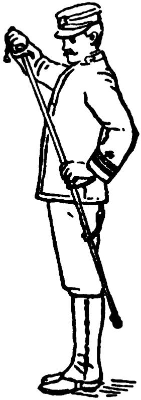


FIG. 184.

(3) When arms are brought to the **order,** the officers or enlisted men with sword drawn execute the **order.**

(4) Marching in **double time,** the sword is carried diagonally across the breast, edge to the front, right forearm horizontal; the left hand steadies the scabbard.

(5) Marching in **route step,** also when the command is not under arms, the sword remains sheathed.

(6) **P. os.** with swords drawn, salute by executing the first motion of **present swords,** as explained for officers. This position is also taken at inspection; when the inspecting officer passes, the wrist is turned outward to show the flat of the sword toward the face.

To Return Sword.

2275. Being at the order or carry: 1. **Return.** 2. **SWORDS.**

(1) At the first command, take the position of the first motion of **present swords,** at the same time grasp the scabbard at the upper band with the left hand and turn it edge to the front. At the second command, lower the blade, the point describing a semicircle to the left, turn the head slightly to the left, fixing the eyes on the opening of the scabbard, insert the point, guiding it with the thumb and forefinger of the left hand; return the sword quickly, turn the guard to the rear, drop both hands by the sides, and look to the front.

(2) Mounted officers return swords without using the left hand; the sword is hooked up on dismounting.

CHAPTER X.

PHYSICAL DRILL WITH ARMS.

NOTE.—From the Manual of Physical Drill by Chaplain W. O. Holway, U. S. N. From Ship and Gun Drills, 1905.

2276. General rules.—(1) All movements in this section are in four counts, and, except "Coming to ready," are performed two (or four) times.

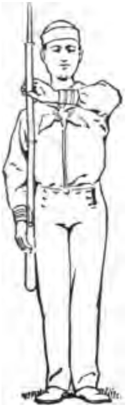


FIG. 185.

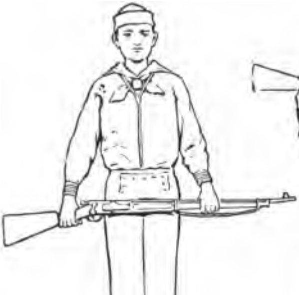


FIG. 186.

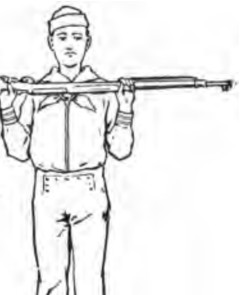


FIG. 187.

(2) The exercises may be executed by command, or to music, or silently, following the motions of a leader, and may be discontinued by the command **HALT**, when the "**ready**" will be resumed.

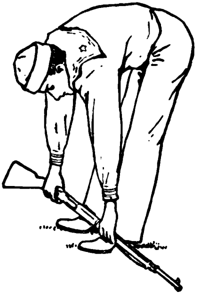
(3) Take intervals or distances as prescribed in the drill regulations. (Art. 1532 *et seq.*)

Coming to ready.—Commands: **Come to ready**—1, 2, 3. (Figs. 185, 186, and 187.)

1. Raise the piece with the right hand, grasp it with the left at the height of the right shoulder, knuckles towards the body. The right hand will grasp the small of the stock, forefinger under the guard.

2. Let the piece drop in front of the body to a horizontal, slings down, keeping the body erect.

3. Raise the piece horizontally to the height of the shoulders, slings up, at the same time moving the left foot to the left about 12 inches. Keep the chest out, and the shoulders well back. This position is **ready**, and is the starting point of all the movements under arms.



FIR. 188.

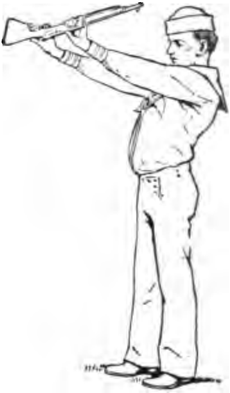


FIG. 189.

2277. First exercise—down and forward.—SPECIAL ACTION.—The muscles of the hips, back and arms. Commands: **Down and forward**—1, 2, 3, 4; 1, 2, 3, 4, etc. (Figs. 188 and 189.)

1. From **ready**, lower the piece horizontally to the **insteps**, keeping arms and knees (if possible) straight.

2. Back to **ready**, chest out, elbows back.

3. Push piece horizontally forward.

4. Back to **ready**.

2278. Second exercise—forward and up.—SPECIAL ACTION.—The muscles of the arms, and of side walls of the chest.

Commands: **Forward and up.**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 190.)

1. From **ready,** push out horizontally forward as in the last exercise.
2. Back to **ready,** chest out, elbows back.
3. Push the piece to high vertical, keeping it horizontal, and expanding chest.
4. Back to **ready.**

2279. Third exercise—up and shoulders.—SPECIAL ACTION.—The muscles of the arms, and of the side and front walls of the chest.

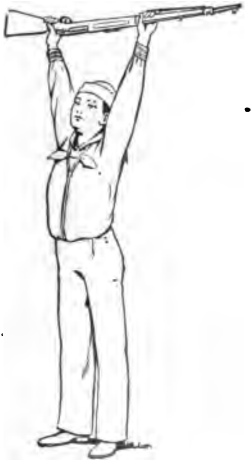


FIG. 190.

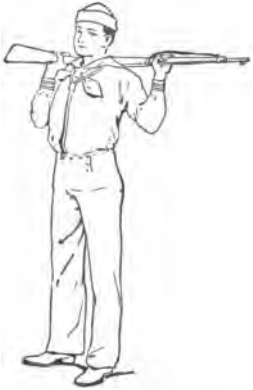


FIG. 191.

Commands: **Up and shoulders**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 191.)

1. From **ready,** push the piece to vertical, as in last exercise.
2. Lower piece to back of shoulders, head up, elbows well back.
3. Up again to vertical.
4. Down to **ready.**

2280. Fourth exercise—side pushes.—SPECIAL ACTION.—The rotary muscles of the body and thighs; the loin muscles.

Commands: **Side pushes**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 192.)

1. From **ready**, push the piece horizontally to right side, twisting the body, keeping the eyes on the piece, but keeping the heels firmly on the ground.
2. Back to **ready**, chest out, elbows back.
3. Push the piece to the left side.
4. Back to **ready**.

2281. Fifth exercise—diagonal lunges.—SPECIAL ACTION.—The muscles of the arms, back, and legs.

Commands: **Diagonal lunges**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 193.)

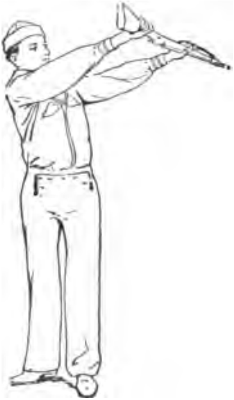


FIG. 192.

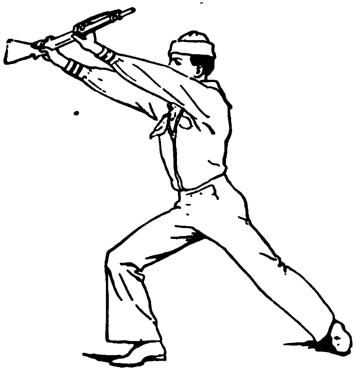


FIG. 193.

1. From **ready**, lunge diagonally to the right, about 36 inches, with the right leg, at the same time bringing the piece up horizontally to 45°. The left foot should be flat, and the eyes directed to the piece.
2. Back to **ready**, chest out, elbows back.
3. Lunge to the left with left leg, as above.
4. Back **to ready**.

2282. Sixth exercise—forward lunges.—SPECIAL ACTION.—The muscles of the arms and legs and the side walls of the chest.

Commands: **Forward lunges**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 194.)

1. From **ready**, lunge directly to the front, about 36 inches, with the right leg, at the same time raising piece horizontally to vertical, and directing the eyes to the piece. Keep left foot flat.
2. Back to **ready**.
3. Lunge to the front with left leg, as above.
4. Back to **ready**.

2283. Seventh exercise—front sweeps.—SPECIAL ACTION.—All the principal posterior muscles of the body.

Commands: **Front sweeps, slow**—1, 2, 3, 4; 1, 2, 3, 4. (Fig. 195).

1. From **ready**, raise the piece horizontally to high vertical, keeping the chest well out, and emphasizing the up-stretch.
2. Lower the piece slowly in front semicircle to insteps, keeping the arms straight and emphasizing the out-reach.
3. Raise the piece slowly in front semicircle to vertical.
4. Down to **ready**.

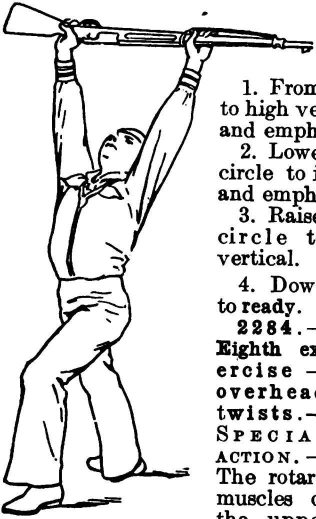


FIG. 194.

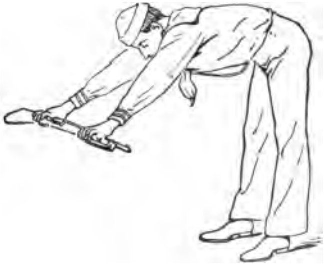


FIG. 195.

2284.—Eighth exercise—overhead twists.—SPECIAL ACTION.—The rotary muscles of the upper part of the body; also stimulates the venous circulation.

Commands: **Overhead twists, butt front.**—1, 2, 3, 4; **muzzle front**—1, 2, 3, 4. (Figs. 196–197.)

1. From **ready**, raise the piece overhead, at the same time twisting it till the butt points directly forward. Keep the piece horizontal.
2. Twist the piece to the right until the muzzle points directly

forward. Hold the hips firmly forward, confining the movement to the upper part of the body.

3. Twist back till the butt points directly forward.

4. Lower the piece to **ready**.

1. From **ready**, raise the piece overhead, at the same time twisting it till the muzzle points directly forward.

2. Twist the piece to the left until the butt points directly forward.

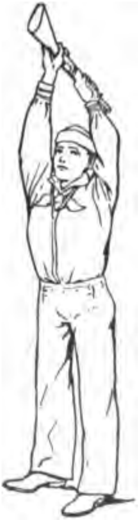


FIG. 196.

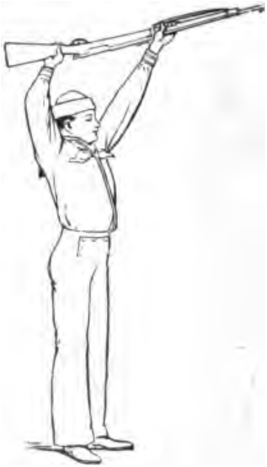


FIG. 197.

3. Twist back until the muzzle points forward.

4. Lower the piece to **ready**.

2285. Ninth exercise—side twists.—SPECIAL ACTION.—The muscles of the sides, loins, and small of the back.

(1) Commands: **Side twists**—1, 2, 3, 4; 1, 2, 3, 4. (**Figs.** 198 and 199).

1. From **ready**, drop the piece horizontally in front to position No. 2 in **coming to ready**.
2. Lifting the butt up, carry the piece strongly to the left side and out, muzzle pointing directly down. Keep the hips firm.
3. Return the piece to position No. 2 in **coming to ready**.

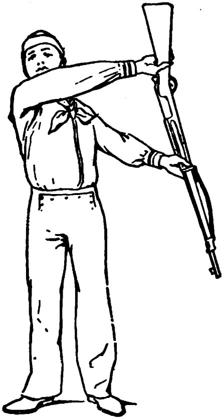


FIG. 198.

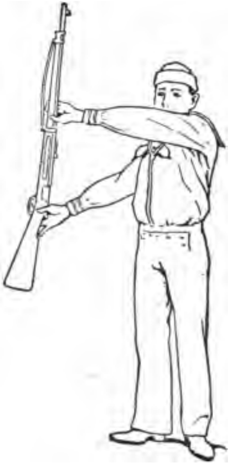


FIG. 199.

4. Lifting the muzzle, carry the piece strongly to the right side and out, muzzle pointing directly up.

(2) Repeat the exercise.
(3) At the end of the ninth exercise, come to **order arms**.

CHAPTER XI.

BAYONET TRAINING AND WALL SCALING.

Sec. I.—BAYONET TRAINING.[1]

General Principles.

2286. Bayonet fighting developed great importance in the World War. Violent hand-to-hand combat with the bayonet was of frequent occurrence and the side most skilled in its use, and developing the best teamwork, usually won.

2287. Close-in fighting with the bayonet and hand-to-hand conflicts will be of very rare occurrence in the operations of the landing force. However, bayonet training has important advantages; it develops strength, skill, and endurance, as well as individuality, quick obedience to command, and fighting spirit.

2288. The drills should be short and every effort made to hold the interest of the men, and to excite their enthusiasm and the desire to excel in skill with the bayonet. Officers and petty officers must themselves be skilled in bayonet fighting in order to obtain the necessary proficiency among the men.

2289. Interest in the work is to be created by explaining the reasons for the various positions, the method of handling the rifle and bayonet, and the use of parries and thrusts. Before requiring men to take a position or execute a movement for the first time, the instructor shows them the position and explains essential points. Then show the position a second time, making the men observe each movement. The class is then ordered to assume the position explained and shown.

2290. The men should be accustomed to wear the cartridge belt in the training, and full equipment may be required during assault practice.

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[1] Adapted from the Bayonet Training Manual, British Army, 1916, and by courtesy of the U. S. Infantry Association.

2291. The greatest care should be taken that the object representing the opponent and its support should be incapable of injuring the bayonet or gun stock. Only light sticks (the parrying stick, Fig. 211) will be used for parrying practice.

The chief causes of injury to the bayonet are: Insufficient instruction in bayonet training; failure to withdraw the bayonet clear of the dummy before advancing; and placing the dummies on hard, unprepared ground.

2292. (1) Intervals and distances will be taken as in infantry Drill Regulations, except that in formation for bayonet exercises the men should always be at least 6 paces apart. Classes should always work with bayonets fixed.

(2) When working in ranks in assault practice against dummies the intervals may be reduced when necessary.

(3) When thrusts have been made advancing, the ranks will change position by coming to the **high port**, doubling past each other right shoulder to right shoulder and turning about. When working against dummies, men will always continue the movement past the dummy, which they will leave on their right.

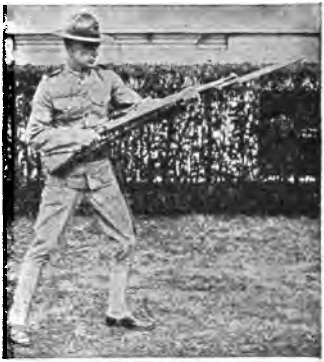
FIG. 200.

2293. Frequent practice in charging short distances should be given in connection with the bayonet training in order to encourage dash and gradually to strengthen the leg muscles and improve the wind.

Positions and Movements.

2294. GUARD. Point of the bayonet directed at the base of the opponent's throat, the rifle held easily and naturally with both hands, the barrel inclined slightly (about 30°) to the left, the right hand at the height of the belt grasping the small of the stock, the left hand holding the rifle at the most convenient position in front of the rear sight, so that the left arm is only slightly bent; i. e., making an angle of about 150°; the legs well separated in a natural position, such as a man walking might adopt on meeting with resistance; i.e., left knee slightly bent, right foot flat on the ground, with toe inclined to the right front.

The position should not be constrained in any way, but be one of aggression, alertness, and readiness to go forward for immediate attack (see Fig. 200).

Common faults:

(1) Leaning body back.
(2) Left arm too much bent.
(3) Right hand held too low and too far back.
(4) Rifle grasped too ridigly, restraining all freedom of movement.

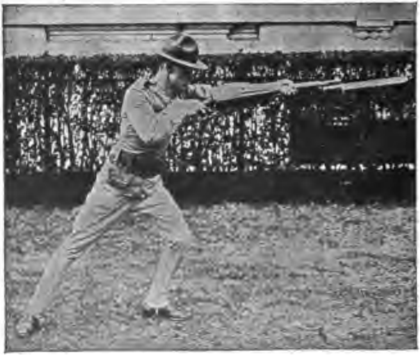

FIG. 201.

2295. **REST**. Assume the "order" in the easiest way without moving the feet.

2296. Being in any position, to resume the position of "attention": 1. **Order**, 2. **ARMS**.

2297. **HIGH PORT**. In this position the hands hold the rifle as in guard; the left wrist level with, and directly in front of, the left shoulder; the right hand above the right groin and on level with the belt.

When jumping ditches, surmounting obstacles, etc., this position of the rifle should be approximately maintained with the left hand alone, leaving the right hand free.

2298. Being in position of guard: **LONG THRUST**, grasp the rifle firmly; vigorously deliver the thrust to the full extent of the left arm, butt running alongside and kept close to the right forearm; body inclined forward; left knee well bent; right leg braced, and weight of the body pressed well forward, with the fore part of the right foot, heel raised.

The chief power in a thrust is derived from the right arm with the weight of the body behind it, the left arm being used more to direct the point of the bayonet. The eye must be fixed on the object thrust at. In making thrusts other than straight to the front, the left foot should move in the same direction as that in which the thrust is made. During the later stages of the lesson the men should be practiced in stepping forward with the rear foot when delivering the thrust.

Common faults: (1) Rifle drawn back before delivering the thrust.

(2) Butt of the rifle held as high as or against the right shoulder.

(3) The eyes not directed on the object.

(4) Left knee not sufficiently bent.

(5) Body not thrust sufficiently forward.

2299. The **long thrust** is made against an opponent at a range of about 4 to 5 feet from the attacker's eye.

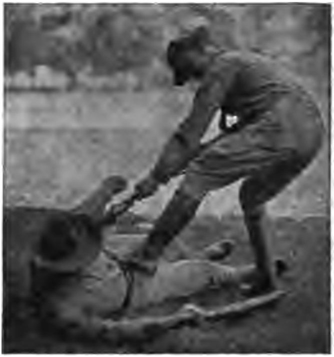

FIG. 202.

2300. **WITHDRAWAL.** To withdraw the bayonet after a long thrust has been delivered, draw the rifle straight back until the right hand is well behind the hip and immediately resume the guard. If the leverage or proximity to the object transfixed renders it necessary, the left hand must first be slipped up close to stacking swivel and when a pupil has reached that stage of delivering a thrust while advancing on a dummy, he will adopt this method. Or where the object is prone, the foot may be used against the object.

After every thrust a rapid **withdrawal**, essential to quick work with the bayonet, should be practiced before returning to the guard.

2301. **RIGHT (LEFT) PARRY.** From the position of **guard**, vigorously straighten the left arm, without bending the wrist or twisting the rifle in the hand, and force the rifle forward far enough to the right (left) to ward off the adversary's weapon.

The eyes must be kept on the weapon which is being parried.

Common faults: (1) Wide sweeping parry with no forward movement in it.

(2) Eyes taken off the weapon to be parried.

2302. Men must be taught to regard the parry as part of an offensive movement; namely, of the thrust which would immediately follow it in actual combat. For this reason, as soon as the movements of the parries have been learned, they should always be accompanied with a slight forward movement of the body.

Parries will be practiced with right, as well as with the left, foot forward, preparatory to the practice of parrying when advancing.

2303. SHORT THRUST. Shift the left hand quickly toward the muzzle and draw the rifle back to the full extent of the right arm, the butt either upward or downward, according to whether a low or a high thrust is to be made, then deliver the thrust vigorously to the full extent of the left arm.

The short thrust is used at a range of about 3 feet, and in close fighting, it is the natural thrust to make when the bayonet has just been withdrawn after a long thrust. If a strong withdrawal is necessary, the right hand should be slipped above the rear sight after the short thrust has been made.

2304. JAB (OR UPWARD THRUST). From the position of short thrust shift the right hand up the rifle and grasp it above the rear sight, at the same time bringing the rifle to an almost vertical position close to the body, and, from this position, bend the knees and jab the point of the bayonet upward into the throat or under the chin of the opponent.

Common faults: (1) Rifle drawn backward and not held vertically enough.

(2) Rifle grasped too low with the right hand.

2305. When making a jab from the guard, the right, being in the thrusting hand, will be brought up first.

The jab can be employed successfully in close-quarter fighting in narrow trenches and when embraced by an opponent.

Methods of Injuring an Opponent.

2306. If possible, the point of the bayonet should be directed against an opponent's throat, especially in hand-to-hand fighting. Other vulnerable and usually exposed parts are on the face, chest, lower abdomen, and thighs, and the region of the kidneys when the back is turned. (Small of the back either side of the spine.)

Four or six inches penetration is sufficient to incapacitate and allow for a quick withdrawal, whereas if the bayonet is driven home too far it is often impossible to withdraw it. In such cases a round should be fired to break the obstruction.

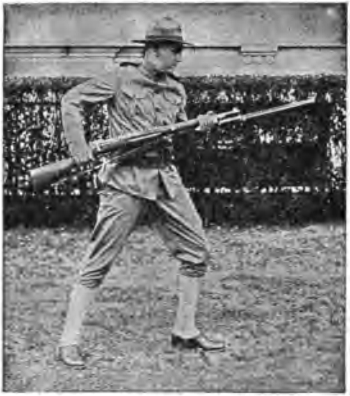

Fig. 203.

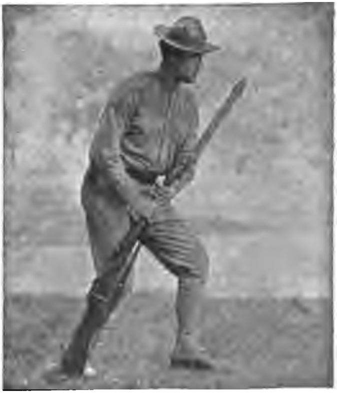

Fig. 204.

2307. It should be impressed upon the class that, although a man's thrust has missed or has been parried or his bayonet has been broken he can, as attacker, still maintain his advantage by injuring his opponent in one of the following ways:

(1) **BUTT STROKE I**: (**UPWARD SWING**). Swing the butt up at the opponent's crotch, ribs, forearm, etc., using a half-arm blow or advancing the rear foot.

(2) **BUTT STROKE II**: (**FORWARD STRIKE**). If the opponent jumps back so that the first butt stroke misses, the rifle will come into a horizontal position over the left shoulder, butt leading; the attacker will then step in with the rear foot and dash the butt into his opponent's face.

(3) **BUTT STROKE III**: (**DOWNWARD CUT**). If the opponent retires still farther out of distance, the attacker again closes up and slashes his bayonet down on his opponent's head or neck.

(4) **BUTT STROKE IV**: (**SIDE BLOW**). If a thrust has been made at an opponent and parried, the butt can be effectively used by stepping in with the rear foot, swinging the rifle to the left and rear, so that the butt leads and is in front of the right forearm. Then dash the butt into the opponent's face, or against the side of his head or jaw. When the opponent is out of distance, butt stroke III can again be used.

In individual fighting, the butt can also be used horizontally against the opponent's ribs, forearm, etc. This method is impossible in trench fighting or in an attack, owing to the horizontal sweep of the bayonet to the attacker's left.

The butt must not be employed when it is possible to use the bayonet effectively.

2308. Butt stroke I is essentially a half-arm blow from the shoulder, keeping the elbow rigid, and it can therefore be successfully employed only when the right hand is grasping the rifle at the small of the stock.

Butt strokes can be used only in certain circumstances and positions, but if men acquire absolute control of their weapons under these conditions they will be able to adapt themselves to all other phases of in-fighting. For instance, when a man is gripped by an opponent so that neither the thrust nor the butt can be used, the knee brought up against the crotch or the heel stamped on the instep may momentarily disable him and make him release his hold.

When wrestling, the opponent can be tripped by forcing his weight onto one leg and kicking that leg away from under him, or any other wrestler's trip; e. g., "back heel."

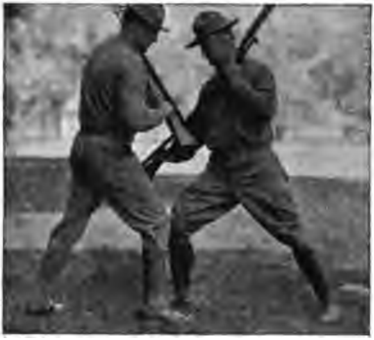

FIG. 205.

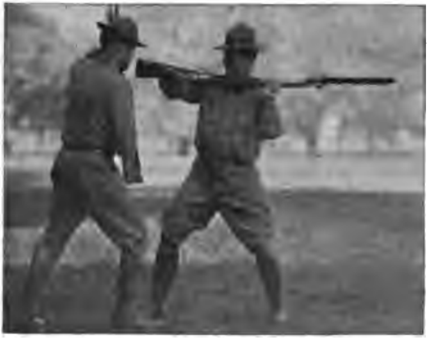

FIG. 206.

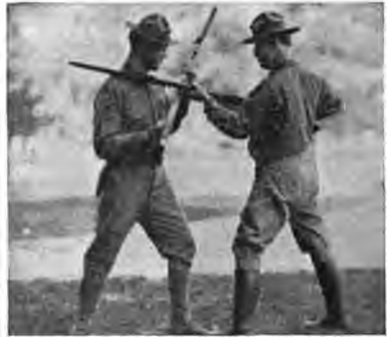

FIG. 207.

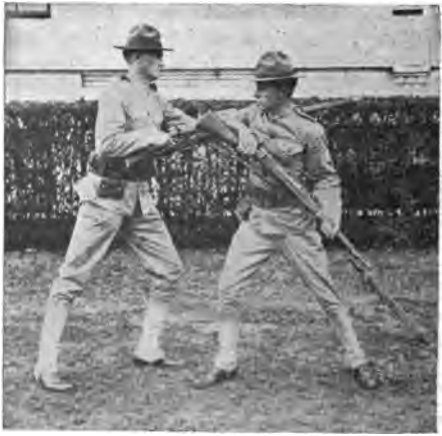

FIG. 208.

The above methods will only temporarily disable an enemy, who must be killed with the bayonet.

In bayonet fighting no "fouls" are known. The only rule to follow is: "Get after your man and put him out of action by any means at your command."

Thrust and Parrying Exercises.

2309. For the thrust and parrying exercises a light stick, 5 feet to 5 feet 6 inches long and ¾ to 1 inch in diameter, must be provided for every two men.

A pad 4 to 5 inches in diameter, made of canvas and stuffed with shredded sacking, is secured by wire set in a notch cut in the stick. A grommet with about 3 inches interior diameter is similarly secured near the upper end of the stick.

2310. The parrying stick is used for practicing the thrusts and jab, according to the position of the ring, alternating with butt strokes and kicks at the pad, according to its position.

In charging practice, both ranks extend to 3 yards interval and 20 yards distance, and the padded ends of the stick are used.

Men of one rank charge at a steady double and thrust at opposing men, who parry. The charging rank halts 20 yards beyond, turns about and charges again, the other rank facing about to meet it.

Exercise Against Dummies.

2311. Intelligent and conscientious practice against dummies is absolutely necessary to develop the strength, skill, and quickness required for a trained bayonet fighter.

Where conditions permit, this should include assault practice across broken ground against dummies suitably arranged, both above ground and in trenches, dugouts, and communicating ways.

2312. Sacks for dummies should be filled with vertical layers of straw and thin sods, leaves, shavings, etc., in such a way as to give the greatest resistance without injury to the bayonet. A realistic effect, necessitating a strong withdrawal, as if gripped by a bone, is obtained by inserting pieces of hard wood, one-fourth inch thick (pieces of crating or boxes), between the stuffing and the sack on the side facing the attacker, with the grain vertical.

The sack dummies can be made to stand on end by fixing a wooden cross or star (two or three pieces of wood about 2 inches broad and three-fourths inch thick nailed across one another) in the base of

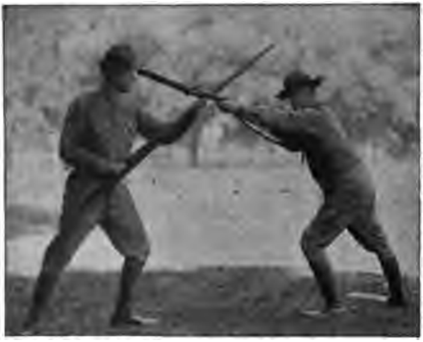

Fig. 209.

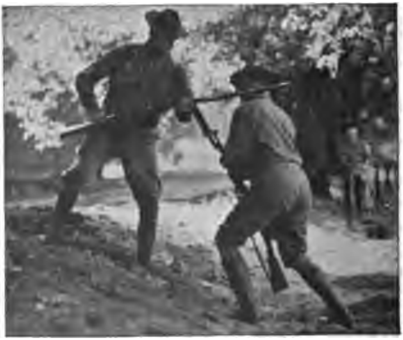

Fig. 210.

the sack before filling it. They can also be placed with good effect on rough tripods or tied to improvised stools. Dummy sacks should be suspended from gallows and weighted or tethered to the ground from the bottom corners.

By the use of a little ingenuity an officer can readily represent the torso of an opponent in positions simulating actual conditions.

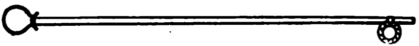

FIG. 211.

2313. For practicing direction, there must always be an aiming mark on the dummy. Carboard disks for this purpose are desirable. By continually changing the position of the mark, the "life" of the dummies is considerably prolonged.

In the absence of disks, five or six spots or numbers can be painted on the dummies as marks.

2314. The men will be taught to transfix a disk or number painted on a dummy; first at a distance of about 5 feet from the dummy, i. e., the extreme range of the bayonet; then, after advancing 3 or more paces. The advance must be made in the most practical and natural way, and should be practiced with either foot to the front when the thrust is delivered. The rifle must never be drawn back to make a long thrust in a forward movement. The impetus of the body and the forward stretching of the arms supply sufficient force.

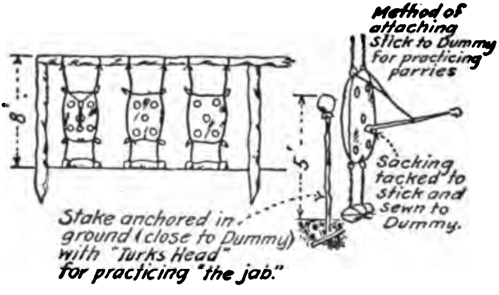
Method of attaching Stick to Dummy for practicing parries
8'
5'
Sacking tacked to stick and Sewn to Dummy.
Stake anchored in ground (close to Dummy) with "Turks Head" for practicing "the jab."

FIG. 212.

The bayonet must be withdrawn immediately after the thrust has been delivered, and a forward threatening attitude be assumed to the side or beyond the dummy.

Unless the rifle is firmly gripped, it is liable to injure the hand.

To guard against accidents, the men must be at least 5 feet apart when the practice is carried out collectively.

The principles of this practice will be observed when thrusting at dummies in trenches, standing upright on the ground, or suspended on gallows. They should be applied at first slowly and deliberately.

2315. The short thrust should be taught in conjunction with the long thrust, the first disk being transfixed with the latter, the second disk with the former. On delivery of the long thrust, if the left foot is forward, the short thrust would take place with the right foot forward, and vice versa.

2316. When the classes have been shown the methods of using the butt and the knees, they should be practiced on a dummy, fitted with the necessary disks or numbers; make a thrust at one; use the knee on another, low down; jab a third, and so on.

Outline of Progressive Instruction.

2317. The following outline is furnished as a guide and in order to insure thorough.and progressive instruction. A list of such movements as are to be covered during the drill period should be made by the officer or petty officer in charge, and be used as necessary in conducting the exercises:

A.

(Movements 1 to 26 by word of command.)

1. Intervals, distances, and positions.
2. Explain hand-to-hand fighting, and inculcate the spirit of the bayonet.
3. Guard.
4. Rest.
5. High port.
6. Long thrust.
7. Withdrawal.
8. Oblique long thrust.
9. Long thrust, followed by long thrust advancing rear foot.
10. Explain value of parries; how, in charging, the parry must be strong enough to beat aside the opponent's weapon.
11. Explain, and make the class perform the movements required for the various parries.
12. Demonstrate the short thrust, and explain when it is used.

13. Short thrust.
14. Withdrawal.
15. Oblique short thrust.
16. Short thrust advancing rear foot.
17. Long thrust advancing rear foot, followed by short thrust advancing rear foot.
18. Demonstrate "jab"; then by placing men in suitable positions, explain when and how it is used in conjunction with thrusts.
19. Jab from jab position.
20. Short thrust advancing rear foot, followed by jab advancing rear foot.
21. Long thrust advancing rear foot, followed by jab advancing rear foot.
22. Short thrust advancing rear foot; jab advancing rear foot; long thrust advancing rear foot.
23. Butt stroke I (upward swing).
24. Butt stroke II (forward strike).
25. Butt stroke III (downward cut).
26. Butt stroke IV (side blow).
27. Trips practiced by men working in pairs.

B.

Class working by eye and thrusting at the open hand of the opponent, placed in various positions on and off the body. Exercise care not to injure the opponent by making the thrusts too vigorous. **Bayonet scabbards fixed to bayonet.**

28. Long thrust.
29. Long thrust followed by long thrust advancing rear foot (opponent retiring).
30. Short thrust.
31. Short thrust advancing rear foot.
32. Long thrust advancing rear foot, followed by short thrust advancing rear foot (opponent retiring).

C.

Class working by eye. Exercises with parrying stick and thrusting ring. **Bayonet scabbards fixed to bayonet.** Men work in pairs.

33. Varied direct and oblique long thrusts at thrusting ring.
34. Parry the stick pointed at the breast.
35. Parry the stick pointed at the breast and deliver thrust.

36. Parry the stick pointed at the head, body, and legs.

37. Same as 36, and deliver thrusts.

38. When standing in a trench, parry thrust made with stick from above.

39. When standing on a parapet, parry a thrust made with stick by a man in a trench.

40. With stick parry a thrust made with stick by advancing opponent.

41. Same as 40, and come back with a thrust.

42. With stick parry thrust made with stick lightly held in one hand by charging opponent (by holding his stick in right or left hand, the attacker will clearly show on which side he is thrusting, and he will pass on that flank).

43. Varied direct and oblique long and short thrusts at thrusting ring.

44. Practice various parries, parries and thrusts, from short thrust position against parrying stick and thrust ring.

45. Jab at thrusting ring.

46. Direct and oblique long and short thrusts and jabs, in varying order, at thrusting ring.

47. When in jab position, ward off high and low thrusts made with stick.

48. Butt stroke I (upward swing) at padded stick.

49. Butt stroke II (forward strike) at padded stick.

50. Butt stroke III (downward cut) at padded stick.

51. Butt stroke IV (side blow) at padded stick.

52. Long thrusts, short thrusts, and jabs, at thrusting ring, with butt strokes at padded stick varied.

D.

53. Vulnerable spots explained; region of kidney shown; practice careful thrusts, delivered without force, at these points, **bayonet scabbards fixed to bayonet.**

Practice against dummies, at designated disks or marks, bayonets fixed, **scabbards withdrawn.**

54. Withdrawal. (a) Stationary. (b) Advancing rear foot. (Demonstrated by instructor on a dummy.)

55. Long thrust.

56. Long thrust advancing rear foot.

57. Advance and deliver long thrust.

58. Advance and deliver long thrusts (at two or more dummies).

59. Dummy fitted with stick to represent opponent on guard. Advance, parry the stick, and thrust.

60. Short thrust.

61. Short thrust advancing rear foot.

62. Long thrust advancing rear foot, and short thrust advancing rear foot.

63. Advance and deliver long thrust and short thrust (at two dummies in suitable positions).

64. Short thrust advancing rear foot, and jab advancing rear foot.

65. Long thrust advancing rear foot, short thrust advancing rear foot, and jab advancing rear foot.

66. Advance, long thrust, and jab.

67. Advance, long thrust, short thrust, and two or more jabs at dummies.

68. Thrusts and jab, followed by butt strokes I to IV at light dummies, and introducing kicks, and any other form of infighting.

The Assault Practice.

2318. (1) For the assault practice the men should be formed at the starting line with about 5 feet intervals.

Several rows of dummies are suspended from gallows, and at least one dummy is provided for each man in each row. All dummies are provided with disks or numbers which must be the aiming mark for the men.

(2) When ordered the men dash forward and deliver their attack, passing from line to line as quickly as the nature of the obstacles and the number of dummies or disks, or the mode of attack ordered makes practicable. The accuracy of the aim is tested by the disk, which can be perforated only by a true and vigorous thrust and clean withdrawal.

(3) The course is varied as skill is gained; the men may be required to start from a jumping-off trench 6 or 7 feet deep and go "over the top," the ground in front being cut into a trench labyrinth with "shell craters," and the dummies distributed in the trenches and craters as well as in lines on gallows.

2319. Throughout the training, men must be constantly practiced in:

(1) The recognized method of carrying the rifle with bayonet fixed (high port).

(2) Rapid advance out of deep trenches.

(3) Control and maintenance of line and opening fire during an advance.

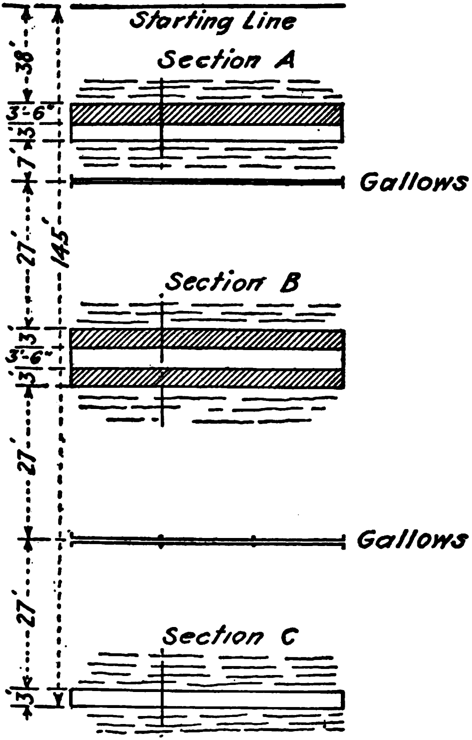

FIG. 213.—Plan of simple assault practice course. It is attacked from each end in turn and the positions of the trench dummies are varied. For cross section at A, B, C, see Fig. 214.

(4) Using the bayonet with effect in the cramped space of communicating and fire trenches.

(5) Re-forming and opening of fire after the assault.

(6) Acting as leaders of attacking party.

2320. Instructors should endeavor by every means in their power to arouse the interest and imagination of their men during the assault practice. The special phase of the combat which is to be carried out in the exercise should invariably be explained beforehand. **Each dummy must be regarded as an actual armed opponent, and each line of dummies as an enemy line attacking, defending, or retiring and be disposed of accordingly.**

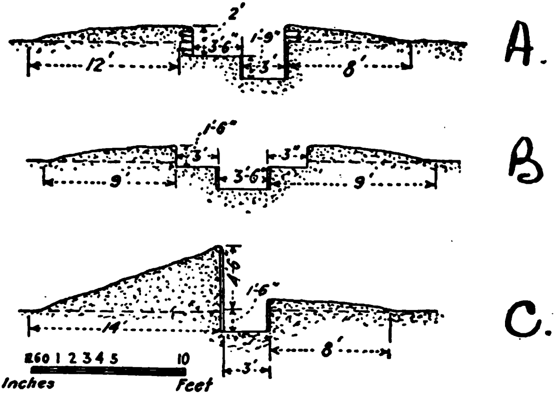

FIG. 214.

2321. Any tendency toward carelessness or slackness must be instantly checked, and it should be impressed on all ranks that a practice assault which is not carried out with the necessary quickness, vigor, and determination is worse than useless.

2322. Lack of imagination, which allows men and their leaders to violate the most elementary principles of tactics in practice assaults against dummies, can lead only to disaster in a real assault against an enemy.

A Guide for Qualified Men's Daily Practice.

(30 minutes.)

2323. (1) 5 minutes.

(a) Long thrust at hand (28–29, progressive program of instruction) (not more than 8 thrusts each man).

(b) Short thrusts (30, 31, 32, progressive program of instruction) (not more than 10 thrusts each man).

(2) 5 minutes, steady advance over obstacles and charge 20 yards, about 100 yards in all.

(3) 4 minutes, parrying stick and thrusting (37, progressive program of instruction).

(4) 4 minutes, butt strokes, each stroke twice (23, 24, 25, 26, progressive program of instruction) or practice trips, etc. (27, progressive program of instruction).

(5) 6 minutes, long thrusts, short thrusts, and jabs at thrusting ring, with butt strokes at padded stick, varied (52, progressive program of instruction).

(6) 6 minutes, final assault practice.

The Tactical Application of the Bayonet.

2324. To attack with the bayonet effectively requires good direction, strength, and quickness during a state of wild excitement and probably physical exhaustion. The limit of the range of a bayonet is about 5 feet (measured from the opponent's eyes), but more often the killing is at close quarters, at a range of 2 feet or less, when troops are struggling in trenches or darkness.

2325. A bayonet assault should preferably be made under cover of fire, surprise, or darkness. In these circumstances, the prospect of success is greatest.

At night, all these covers can be utilized.

On the other hand, confusion is inherent in fighting by night; consequently the execution of a successful night attack with the bayonet requires considerable and lengthy training.

The bayonet is essentially a weapon of offense, which must be used with skill and vigor; otherwise it has but little effect. To await passively an opportunity of using the bayonet entails defeat, since an approaching enemy will merely stand out of bayonet range and shoot down the defenders.

2326. In an assault, the enemy should be killed with the bayonet; go straight at the opponent with the point threatening his throat and deliver a thrust wherever an opening presents itself. If no opening is obvious, create one. Firing should be avoided, for in the mix-up a bullet, after passing through an opponent's body, may kill a friend who happens to be in the line of fire.

2327. Nervous tension due to the anticipation of an attack, as well as the dash across the open and the final dash at the enemy, combine to tire an assaulting party. It is only by their physical fitness and superior skill in the use of the bayonet that they can overcome a comparatively fresh foe.

Therefore, quick aim and good direction of the bayonet when moving rapidly or even when surmounting obstacles, accurate delivery of a thrust and sufficient strength and vigor to penetrate clothing and equipment, the clean withdrawal of the bayonet—which requires no small effort, especially should it be fixed by the bone—are of the greatest importance, and need the same careful attention and constant practice as are devoted to obtaining efficiency with the rifle.

The Assault.

2328. The importance of discipline and organized control throughout the conduct of a bayonet assault can not be overemphasized. It must be remembered that in this, as in all other military operations, success can be achieved only through the closest cooperation of all concerned; and that, while individual initiative is not to be discouraged, it must be strictly subordinated to the intention of the leader of the assaulting party.

Men should be shown by demonstration that it is in their own interests to pay attention to this point, and that the failure of an enterprise can usually be traced to the lack of close cooperation.

2329. During training, the following general principles will be observed:

(1) All members of the attacking party must rise from cover and commence the advance simultaneously. In addition to the advantages of surprise, needless casualties are thereby avoided.

(2) The first stage, especially of a long advance, will be slow and steady—not faster than the pace of the slowest man. Such an advance has a decided moral effect on the enemy, makes certain of the maximum shock at the moment of impact, and at the same time allows the attacking force to reach its objective without undue exhaustion. On the other hand, if the assault is allowed to develop without control and in a haphazard fashion, the moral effect of the steady, resistless wall of men is lost, and the defenders may be given time to dispose of their opponents in detail.

Bayonet control in the attack is just as important and fully as practicable as fire control, and it depends altogether on discipline, which must be taught by close-order work, and on thorough technical instruction in the use of the bayonet. Tactical bayonet control will then follow without much difficulty, provided the instructor has done his work properly.

(3) The actual charge will not be made over a greater distance than 20 paces. Within the last 10 yards, and before closing with the enemy, the rifle will be brought to the threatening, yet defensive, guard position. Line will, as far as possible, be maintained until actual contact with the enemy is gained.

(4) As soon as the enemy's position has been carried, and prior to any attack on a further position, or any other operation whatsoever, every precaution must be taken against a counter attack.

2330. Indiscriminate pursuit with the bayonet must never be allowed unless orders to that effect have been given the leader of the assaulting party. The attacking troops are not so fresh as the enemy, and experience has shown that unorganized pursuit lends itself to ambush and casualties from machine-gun fire. In most cases the work of immediate pursuit is better done by machine guns and by the supporting artillery, the infantry assisting by rapid fire on the retreating enemy.

Sec. II.—WALL SCALING.

2331. Wall scaling is of somewhat limited application. It will without doubt be useful in street fighting and riot duty, and is also an excellent form of physical exercise.

The practical limit of height for rapid escalcade is about 10 feet. Heights up to 15 feet can be scaled by the use of pyramid formations, and the use of lanyards 6 feet long, specially prepared for the purpose, fitted with an eye in one end large enough for a man's hand, and a stopper knot fitted at the other. In an emergency, neckerchiefs knotted together, or gun slings secured by their buckles, can be used. However, the efficient scaling of high walls by such means is not practicable. When it is known beforehand that high walls will have to be scaled, two light scaling ladders, 12 feet long, should be provided for each company of the landing force requiring them. Such ladders can easily and quickly be made up by the carpenter's gang on board ship, from material on hand.

2332. Every training station and barracks should have a "wall" for wall-scaling instruction. The wall should be about 9 feet high and at least 20 feet long; the width at the top should be about 2 feet with a somewhat wider base, 2½ to 3 feet wide. Smooth boards, laid on horizontally on both sides of the wall, should be used; sharp edges at the top should be rounded off.

2333. The unit for wall scaling is the squad. The rear rank mounts in combination with the front rank; there is no deployment of the squad preparatory to mounting.

Officers, petty officers, and file closers mount with the nearest or most convenient squad.

To Mount.

2334. Being in line, or column of squads, near the wall and facing it: 1. **Wall to the front (in succession to the front)**, 2. **MOUNT.**

At the first command, rear-rank men pass their rifles to the front rank. At the second command, the front rank runs to the wall, each man placing a rifle on either side of him, faces about, stoops with hands clasped to form a stirrup, and leans with the back against the wall; each rear-rank man runs toward his own file leader, places the left foot in the stirrup and springs lightly up, grasps the top of the wall and mounts it. Rifles are immediately passed up to the men on the wall, who continue over and dismount on the other side, taking the rifles with them.

Nos. 1 and 3 of the front rank stand fast; Nos. 2 and 4 mount as prescribed for the rear rank, but remain on the wall, astride of it and facing each other; No. 3 front rank, assisted by No. 1, then mounts and passes over the wall in rear of No. 2; he is followed by any officer or petty officer in like manner who is to mount with the squad; No. 1 then jumps, with hands extended, toward the men on the wall, who stoop toward him and grasp his wrists with the left and right hands respectively. Having grasped hands, No. 1 should thrust himself out from the wall and walk up it, assisted by the men on the wall, helping himself, also, by engaging one leg over the top. All then drop to the ground on the far side, take their rifles, and assemble in the desired formation, or scale the next wall to the front.

2335. The preliminary instruction should be given without arms.

Great care must at all times be taken to see that rifles are not dropped or broken. As efficiency is gained, men may be required to scale the wall in light marching order, and finally fully equipped.

2336. A well-trained team lightly equipped, should be able to assemble on the far side of the wall within 25 seconds after the command **mount** has been given.

2337. If under fire during an advance, no attempt to fire from the top of the wall should be made. The far side should first be observed by an officer or petty officer; the rear rank when ordered, will then pass over quickly as prescribed; take extended order prone, and cover, with their fire, the front rank while they mount.

2338. Retirement under similar circumstances is somewhat more difficult. The rear rank deploy and facing the enemy cover the front rank with their fire. The front rank rest their rifles against the wall; Nos. 2 and 4, assisted by Nos. 1 and 3, then mount the wall and remain on top. No. 3, assisted by No. 1, mounts and passes over the wall in rear of No. 2; No. 1 then passes the rifles to Nos. 2 and 4, who pass them on to No. 3. No. 1 then mounts and passes over, assisted by Nos. 2 and 4. Nos. 2 and 4 then step on the shoulders of Nos. 1 and 3, or, if necessary, remain on the wall, and receiving their rifles, open fire over the top of the wall. The rear rank, after the supporting fire has been opened, executes **cease firing,** and mounts and passes over the wall as explained for the front rank.

2339. When the instruction has progressed sufficiently, blank ammunition should be issued, and the men trained in a simulated advance and retirement when under fire.

2340. To scale a wall higher than 10 feet, the following pyramid formation may be useful. It is not intended as a maneuver, but requires four men, here numbered for reference, 1, 2, 3, and 4. Lanyards necessary.

Nos. 1 and 2 face each other, and stand with feet apart near the base of the wall, place their right and left hands, respectively, against the wall, and interlock the fingers of their free hands, palms up, forming a stirrup. No. 3 then places his left foot in the stirrup, and springs lightly up, placing his right foot on the left shoulder of No. 1, his left foot on the right shoulder of No. 2, toes pointing to the right, his left hand against the wall; he then turns slightly. No. 4 grasps right hands with No. 3, places his right foot in the stirrup, then his left foot on the left shoulder of No. 2, loosens the grasp of hands, and places his right foot in the right hand of No. 3, who stoops and braces himself; No. 4 next places his left foot on the left shoulder and his right foot on the right shoulder of No. 3, who then slowly straightens up; No. 4 grasps the top of the wall and straddles it. No. 3, assisted by No. 4, throws his left leg over the wall and faces No. 4. Nos. 3 and 4 drop their lanyards to Nos. 1 and 2 who pass up the pieces and then haul themselves up; all then drop to the other side.

CHAPTER XII.

BUGLE CALLS AND SIGNALS.

MANUAL OF THE BUGLE.

Warning Calls.

2341. **First call, guard mounting, full dress** and **drill call**, precede the **assembly** by such interval as may be prescribed by the commanding officer.

Mess, church, and **fatigue**, classed as service calls, may also be used as warning calls.

First call is the first signal for formation for roll-call and for all ceremonies except guard mounting.

Guard mounting is the first signal for guard mounting.

The field music assembles at **first call** and **guard mounting.**

Formation Calls.

2342. **Assembly**: The signal for companies or details to fall in.

Adjutant's call: The signal for companies to form battalion; also for the guard details to form for guard mounting on the camp or garrison parade ground; it follows the **assembly** at such interval as may be prescribed by the commanding officer.

It is also used as a signal for the battalions to form regiment, following the first **adjutant's call** at such interval as the commanding officer may prescribe.

To the color: Is sounded when the color salutes.

Alarm Calls.

2343. **Fire call**: The signal for the men to fall in, without arms, to extinguish fire.

To arms: The signal for the men to fall in, under arms, on their company parade grounds as quickly as possible.

Service Calls.

2344. Tattoo, taps, mess, sick, church, recall, issue (provision call), **officers', company commanders', chief petty officers', fatigue, school,** and **the general.**

The general is the signal for striking tents and loading wagons preparatory to marching.

Reveille precedes the **assembly** for roll-call.

Taps is the signal for extinguishing lights; it is usually preceded by **call to quarters** by such interval as prescribed.

Assembly, reveille, retreat, adjutant's call, to the color, the **flourishes, ruffles,** and the **marches** are sounded by all the field music united; the other calls, as a rule, are sounded by the musician of the guard or orderly musician; he may also sound the **assembly** when the musicians are not united.

The morning gun is fired at the first note of reveille, or, if marches be played before **reveille,** it is fired at the commencement of the first march.

The evening gun is fired at the last note of **retreat.**

BUGLE CALLS.[1]

BUGLE SIGNALS.

(For method of use and restrictions governing same, see Art. 41.)

27. **Assemble, MARCH.** Same as **Assembly, No. 8.**

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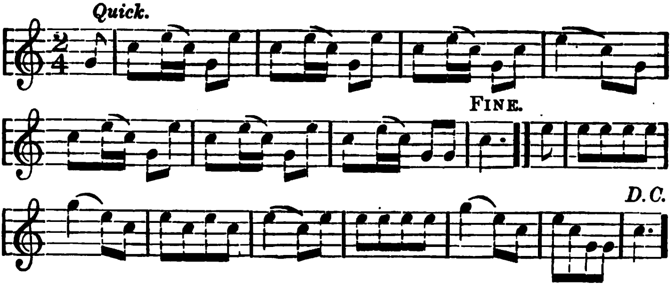
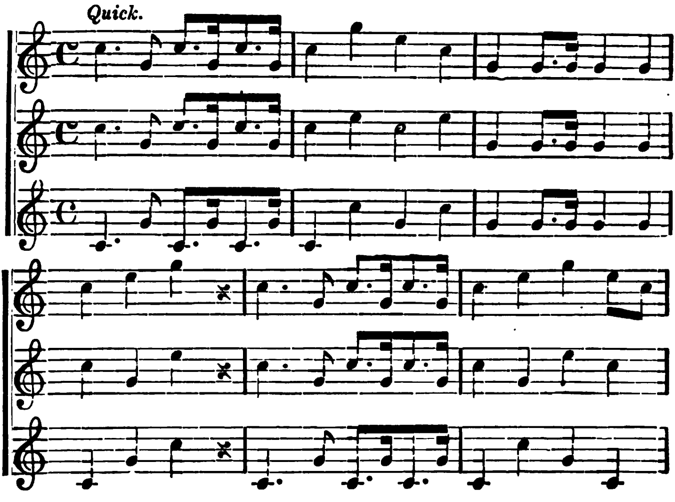
[1] The number in parentheses after the name of each call refers to the number of the call in Ship and Gun Drills, U. S. N.

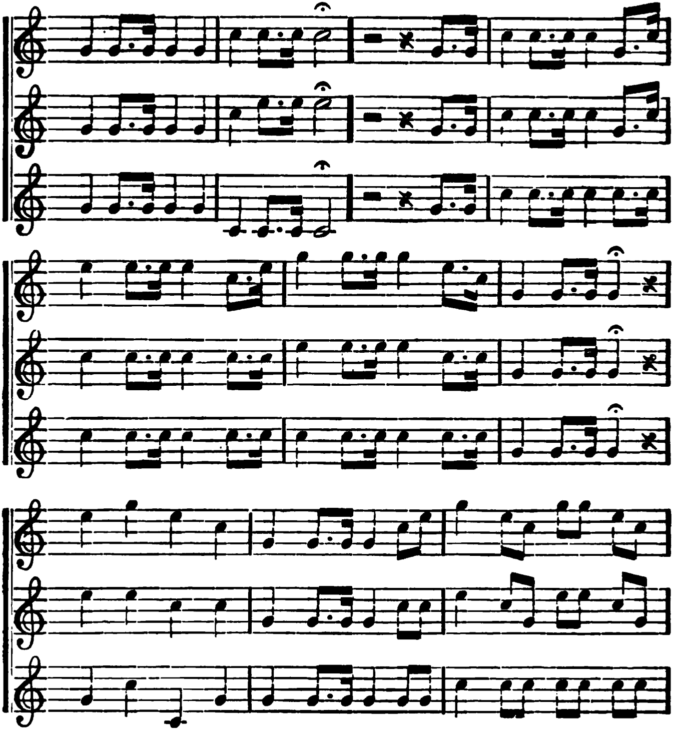
1. Reveille (1).



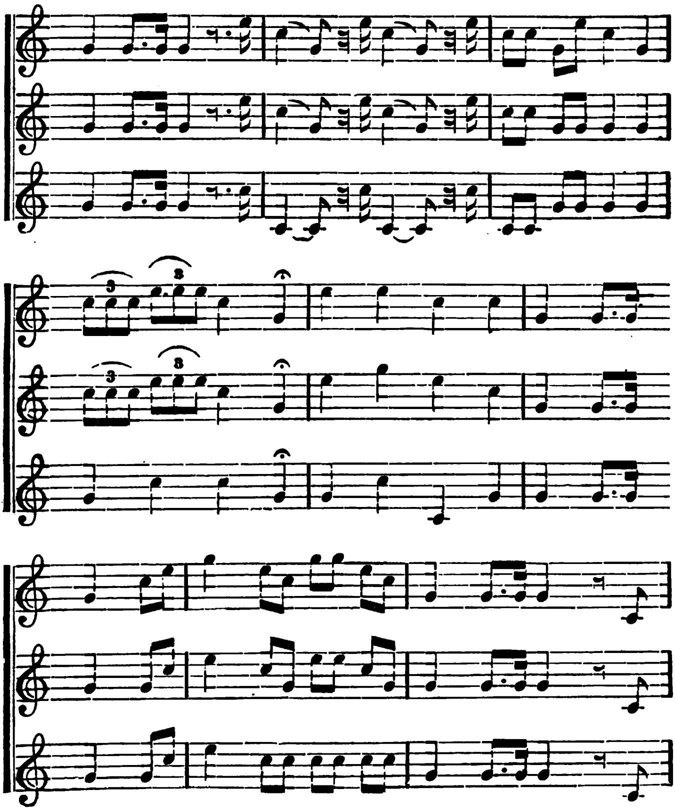
2. Tattoo (2).



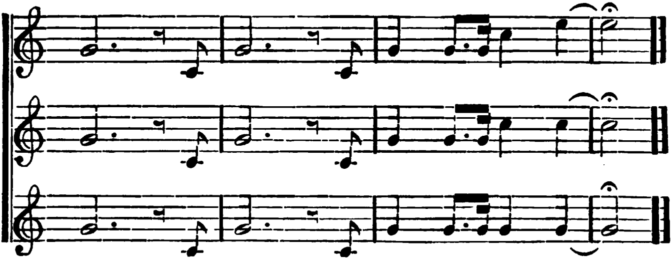
2. Tattoo (2)—Continued.



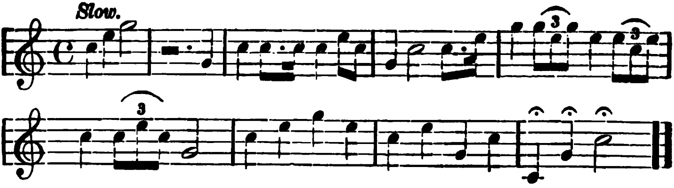
2. Tattoo (2)—Continued.



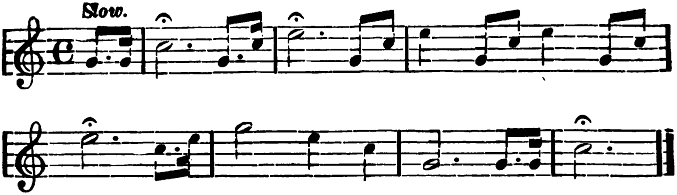
2. Tattoo (2)—Continued.



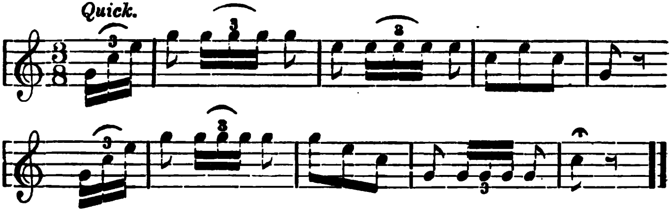
3. Call to Quarters (63).



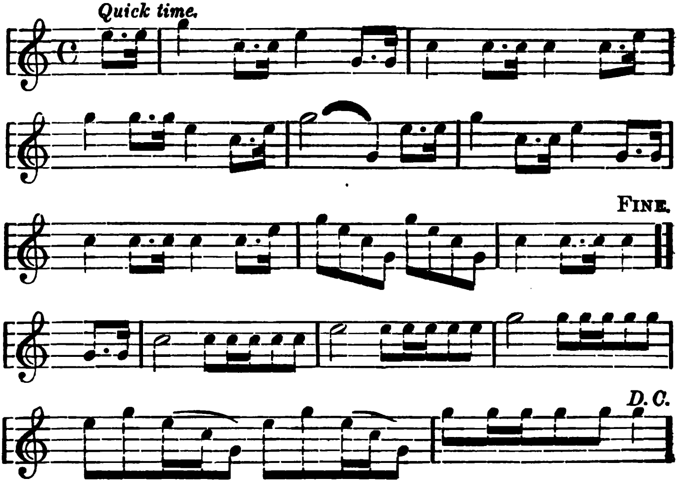
4. Taps (3).



5. First Call (4).

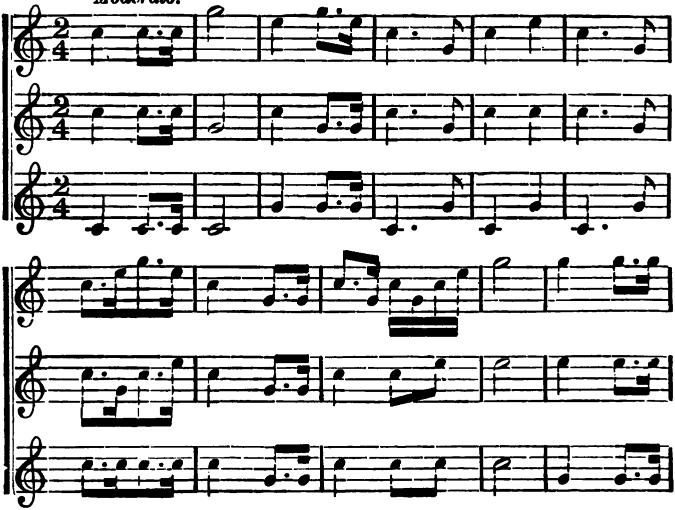


6. To the Color (5).

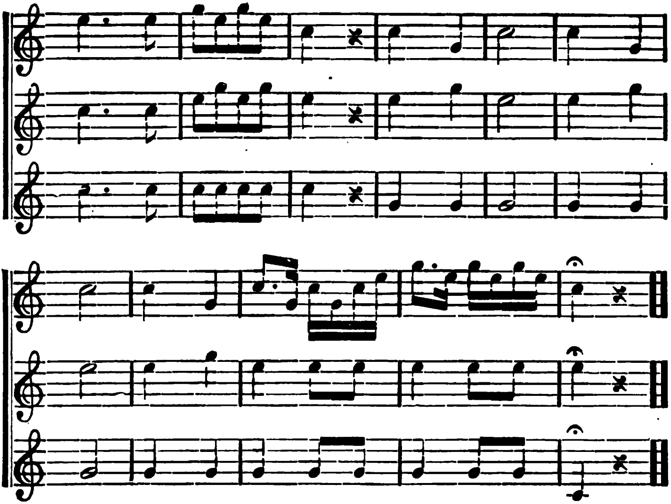


7. Retreat (6).

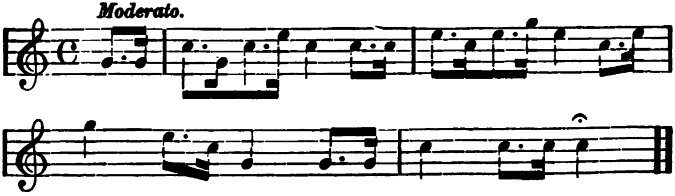
Moderato.



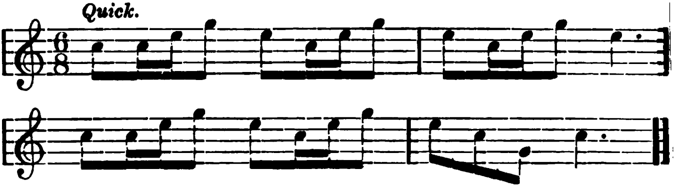
7. Retreat (6)—Continued.



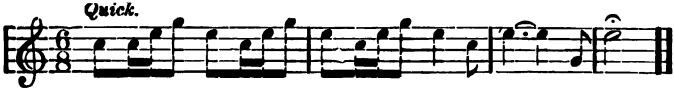
8. Assembly (8).



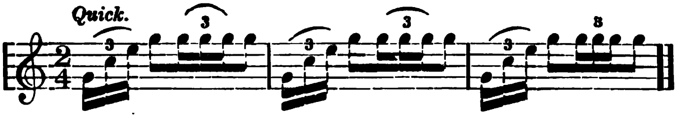
9. Officers' Call (7).



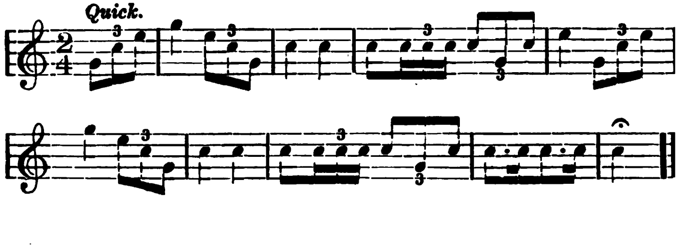
10. Company Commanders' Call (62).



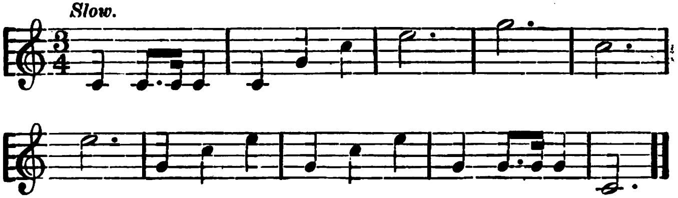
11. Chief Petty Officers' Call (15).



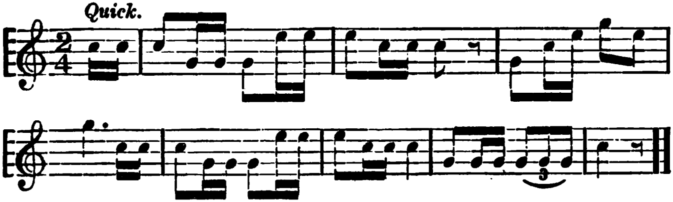
12. Sick Call (13).



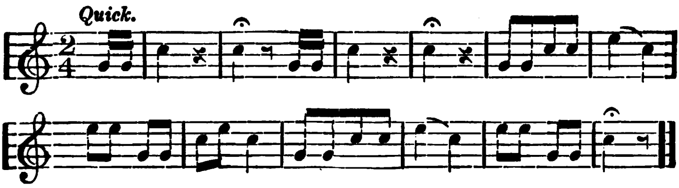
13. Church Call (34).



14. Drill Call (9).

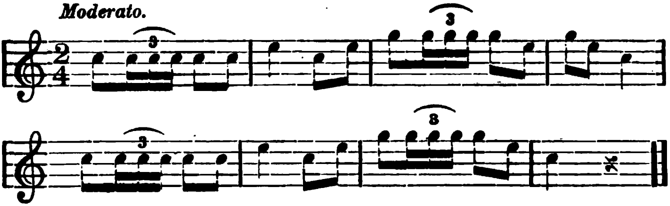


15. School Call (39).



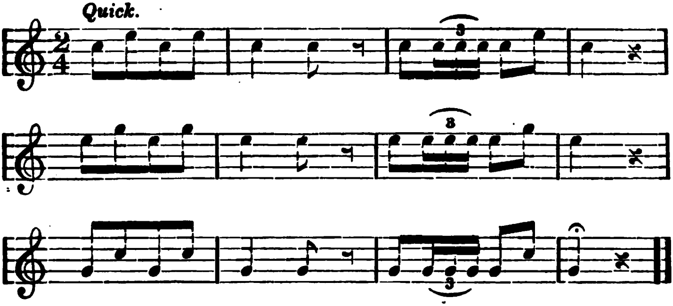
16. Recall (11).

Moderato.



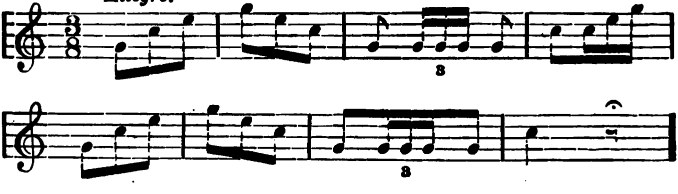
17. Mess Call (17).

Quick.

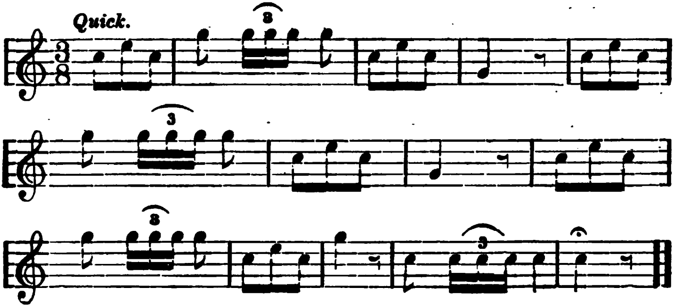


18. Issue (Provisions) (18).

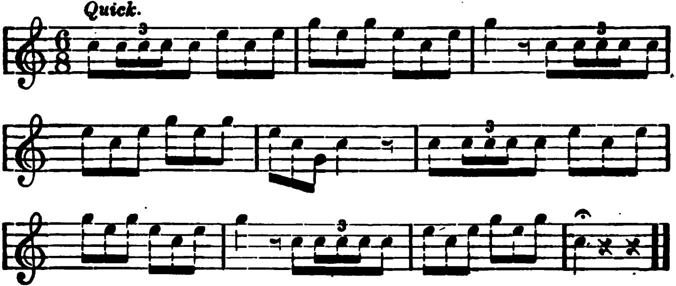
Allegro.



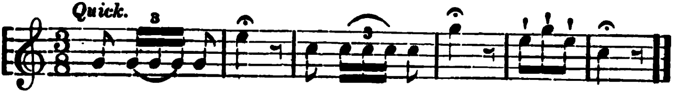
19. Fatigue (37).



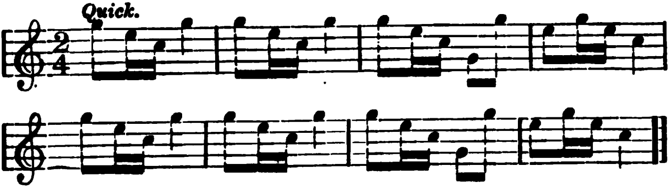
20. Guard Mounting (61).



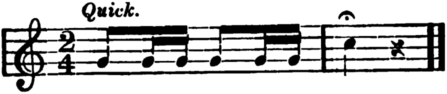
21. Full Dress (64).



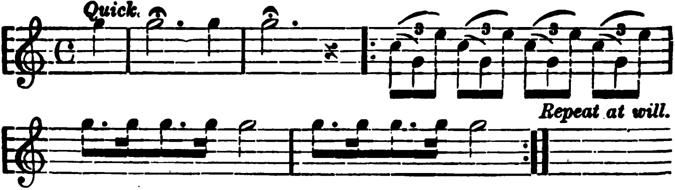
22. Adjutant's Call (66).



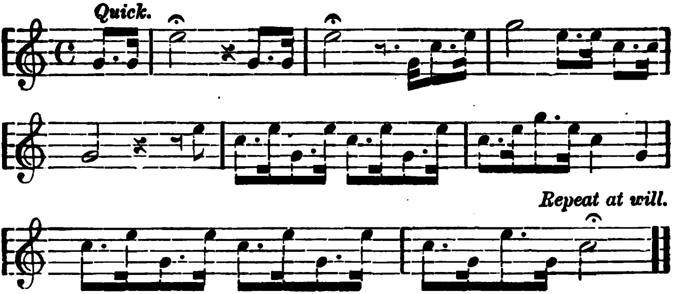
23. Flourishes for Review (35).



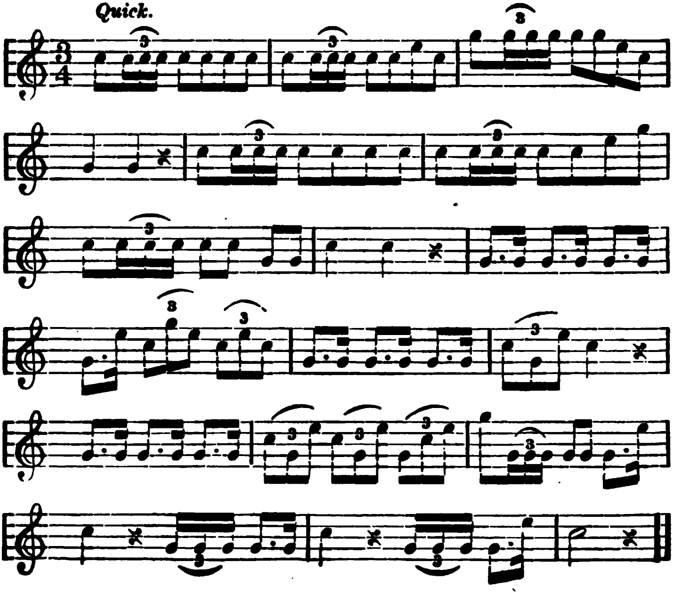
24. To Arms (28).



25. Fire Call (31).

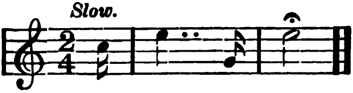


26. The General (65).

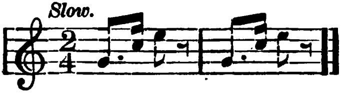


27. Assemble, March. Same as Assembly, No. 8.

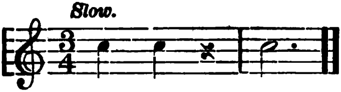
28. Attention (67).



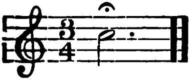
29. Attention to Orders (none).



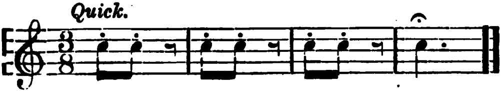
30. Forward, March (68). Also, quick time, if marching in double time.)



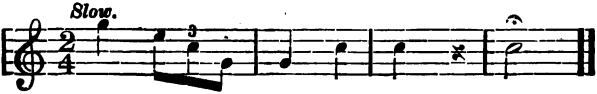
31. Halt (69).



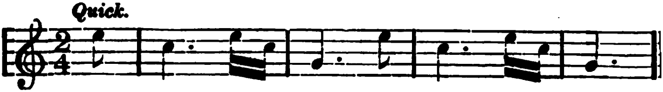
32. Double Time, March (7).



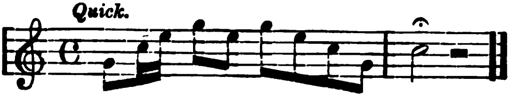
33. To the Rear, March (95).



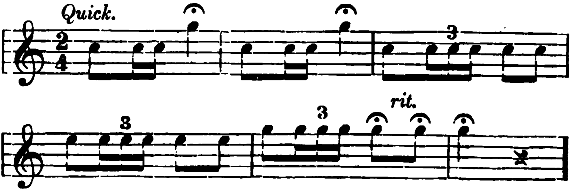
34. Commence Firing (92).



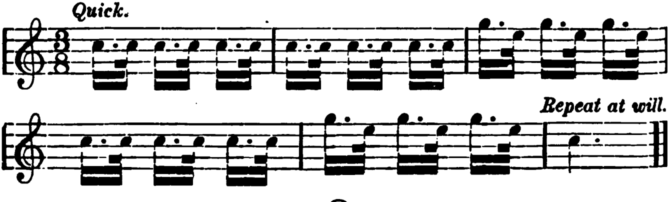
35. Cease Firing (93).



36. Fix Bayonets (none).



37. Charge (72).



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